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SURGICAL PROGRESS

The following question was recently submitted by the Editor to a number of American surgeons: "What do you consider the three greatest achievements of surgery in the past ten years?" The VIRGINIA MEDICAL MONTHLY believes their answers will prove as interesting to its readers as did the answers to a similar question published several months ago:

1. The surgical invasion of the thorax with successful lobectomies for carcinoma;
2. The clinical recognition and successful removal of functionally active adenomas of ductless glands other than thyroid;
3. The furtherance of knowledge concerning the sympathetic nervous system through surgical procedures.

—Harvey Cushing, *Yale University, School of Medicine.*

I dodge the superlative but three great achievements of the last ten years are:

1. Development of transurethral prostatic resection;
2. New methods of anesthesia;
3. Application of surgery to the sympathetic nervous system.

—C. H. Mayo, Rochester, Minnesota.

1. Lobectomy and pneumonectomy in thoracic surgery;
2. The surgery of abnormalities of the endocrine system, especially the adenomas of the parathyroids and pancreas;
3. Diagnostic procedures with intravenous dyes in diseases of the biliary and urological tracts.

—Allen O. Whipple, *Columbia University,* New York City.

1. The development of thoracic surgery involving the treatment of lung, bronchus, etc.;
2. The surgical cure of conditions due to endocrine tumors, of adrenals, parathyroid, etc.;
3. The study and treatment of peripheral, vascular disease.

—Harvey B. Stone, Baltimore, Maryland.

1. The use of barbiturates as a preliminary for basic anesthesia;
2. The newer operations for the relief of hypertension;
3. The establishment of hyper-parathyroidism.

—C. D. Brooks, Detroit, Michigan.

1. The various operative procedures developed for the treatment of pulmonary tuberculosis;
2. The perfection of technique of lobectomy (pulmonary);
3. The successful transplantation of portions of ductless glands.

—Carl Eggers, New York City.

1. Surgery of the sympathetic nervous system;
2. Surgery for relief of certain diseases of the parathyroid glands;
3. The standardization of operative technique and the lowering of surgical mortality in cancer of the large bowel and rectum.

—Fred W. Rankin, Lexington, Kentucky.

1. Parathyroid surgery;
2. Removal of entire lung or portions of lung;
3. Hyperinsulinism—removal of pancreatic tumors.

—Adrian V. S. Lambert, *Columbia University,* New York City.

If I had to distinguish fields for progress under your caption, I should say that the three greatest strides forward were made in the fields of

1. Thoracic surgery;
2. Neurological surgery;
3. Bronchoscopy.

—Elliott C. Cutler, *Peter Bent Brigham Hospital,* Boston.

Nothing done in the past ten years impresses me as a "greatest" achievement.

1. One might think of the successful removal of the entire lung for carcinoma;
2. There have been tremendous improvements in technic;
3. Anesthesia has shifted somewhat in these ten years.

—George P. Muller, *University of Pennsylvania,* Philadelphia, Pa.

XUM

SYMPOSIUM ON HEART DISEASE*

FUNDAMENTALS IN THE PHYSIOLOGY AND PATHOLOGY OF THE CIRCULATION.

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The fundamental physiology of the circulation begins with the function of the individual muscle fiber. The heart muscle has an inherent rhythm, which is as mysterious as life itself. The explanation as to this rhythmic contraction has been explained by the myogenic theory, or the neurogenic theory. The proof of either of these theories has been impossible.

The actual mechanism of contracting heart muscle has been the subject of a great amount of research. Briefly, Ringer[1] noted that if an excised heart is infused with aqueous solution of calcium, potassium and sodium salts in proper concentration, rhythmic function of the heart will continue for a long time, and that these three salts are necessary for continuance of muscular contraction. W. H. Howell[2] noted that antagonism between sodium and calcium, present in balanced ratio, acts as the exciting agent for spontaneous beats. Loeb[3] observed that the presence of certain ions influences the imbibition of water by soaps, and that variation of the kind and concentration of these ions can cause water to proceed into or out of the soap. Loeb's theory is that the various ions enter the muscular cell, and unite with cellular constituents. The sodium ion enters the cell, displaces a portion of the calcium from its intracellular compounds, and by this displacement excites the cell to contract.

The theory of G. R. Mines[4] assumes that the contractile mechanism responds to a transitory increase of hydrogen ions at interfaces within the cardiac muscle structure. Such change (H-ion conc.) will depend upon constant permeability of cell membranes. He claims calcium as a combining ion; sodium and potassium as nomadic ions; hydrogen and hydroxyl ions as polarizing, which affect the surface potential of the cell. Zwaardemaker[5] believes there is a hormone manufactured by skeletal muscle that is changed by the radioactivity of potassium to automatin which is capable of giving automaticity to heart muscle.

These theories, and there are numerous other theories, are based upon extensive fundamental studies of the contracting heart muscle fiber, and mean that there is a delicate chemical and physico-chemical reaction which causes muscle fiber contraction, and which, during contraction, furnishes material for rest and relaxation of the fiber to a state where contraction will occur again. In a general way, these theories are of prime importance to us as clinicians in attempting to understand the behavior of the circulation.

The pathological consideration here is that whatever process damages heart muscle fiber, whether inflammatory infections, degenerative, toxic, due to physical agents, chemical agents or injury, the function of the heart will suffer.

There are names for various pathological processes which are found in the heart muscle; but these names are attempts to express the degree of damage to the heart muscle generally, or at some particular place in the heart. Roughly, there are three divisions under which the physiological and pathological functions of the circulation may be discussed, and each of these divisions is of prime importance.

First, there is the mechanical aspects of the circulation, by which I mean the pumping action of the heart, pressures within heart chambers and blood vessels, etc., hydrostatic factors, amount of blood, work rate, and viscosity of blood.

Second, the chemical aspects of the circulation, by which I mean: the composition of the blood, condition of blood cells, electrolytes within the blood, endocrine glands, bacterial infections, respiratory exchanges, excretion of products of metabolism.

Third, neurological aspects of the circulation. By this I mean those nerve fibers which affect heart

*The four papers by Drs. Morison, Stuart, Jackson and Owens were read as part of a Symposium on Heart Disease before the Southwestern Virginia Medical Society, at Marion, Va., March 23, 1934.

rate; pressor and depressor accelerator—vagus, receptive stimuli, internal stimuli, vasomotor nerves.

The pumping action of the heart for each normal heart beat is initiated at the sino-auricular node, or pacemaker. This is a small area of tissue lying at the fork formed by the upper appendage of the right auricle and the superior vena cava. The impulse for the heart beat starts here and travels by an undiscovered path to the auriculo-ventricular node (Keith and Flack), and from thence is transmitted through the bundle of His to the right and left ventricles.

Pathologically, if the sino-auricular node is destroyed, the rhythm of the heart is then initiated by the auriculo-ventricular node, and the heart rhythm may remain regular. If the bundle of His be destroyed before division to right and left branches, then heart block occurs, the auricles being wholly dissociated from the ventricular beats. If the right or left bundle be destroyed, then there is bundle branch block to the right or left ventricle.

Each impulse initiated at the pacemaker begins an electrical wave which passes through the heart through the channels mentioned. These electrical waves precede the actual muscular contraction in the different chambers of the heart by measured times. The function of the sino-auricular node is to initiate impulses, which are spread to the auriculo-ventricular node and throughout the ventricles by the bundle of His or the conduction bundle. The auricular contraction starts about 0.25 sec. after the impulse originates.

Starling has stated that the pumping action of the heart and state of peripheral circulation are the chief factors in determining the systemic flow; and, further, that the healthy heart maintains an output such that the venous pressure in the vena cava remains at zero for inflows up to one liter per minute. Barcroft[6] states that the heart reacts to change in the peripheral circulation by adjusting its output to maintain venous pressure approximately constant.

So the pressure changes in the pumping system start at the vena cava at zero, though there are variations of this, depending upon respiration and upon whether the right auricle is in diastole or systole. The pressure within the auricles during systole is low a few mm. of mercury because its contraction requires very little force to deliver blood into open auriculo-ventricular valves and the relaxed ventricle. The ventricular pressure rises rapidly, opens the semilunar valves, discharges blood into the aorta, and the pressure falls, the semilunar valves close and the muscle is relaxed.

Pathologically, the things which may interfere with the pumping action of the heart are: Disturbance to any muscle or part of heart muscle, strain, tumors, age, damage to muscle fibers, fibrosis degeneration, infections, endocardial damage, epicardial damage, pericardial damage, extracardiac pressure, interference with venous inflow, obstruction to venous inflow, valvular damage preventing apposition of valves, narrowing of their lumen, or dilatation of their lumen.

The circulation to the heart muscle, once thought very simple, has been shown to be a most complex affair. The heart's function is dependent upon its circulation. It has been shown by Wearn and Mettier[7] that there is communication between the coronary arteries and the chambers of the heart.

The coronary arteries arise from the aorta above the semilunar valves, one branch going down the left ventricle, one down the right ventricle. There is extensive anastomosis,[8] extracardiac, of these coronary arteries, extending to the mediastinum, lungs, parietal pericardium, both surfaces of the diaphragm, and through the vasa vasorum to the abdominal aorta. Other than these extracardiac branches, the coronary arteries give off branches which have three different routes through the heart walls: 1st, they distribute blood to arteries and capillaries, to veins or to Thebesian veins, thence to heart chambers; 2nd, from coronary arteries to the vessels described by Wearn and Mettier,[9] called arterio-luminal vessels, thence to heart chambers; 3rd, from coronary arteries to arterio-sinusoidal vessels (Wearn and Mettier), then to arterioles or to myocardial sinusoids, thence to heart chambers. The Thebesian veins communicate with heart chambers or capillary beds, thence to veins—coronary sinus, or to arterio-luminal vessels, or myocardial sinusoids.

This extensive circulation means that each muscle fiber of the heart has a relatively tremendous supply of blood; and that a provision is made for a supply of blood to muscular tissue under unusual conditions.

XUM

PATHOLOGICAL CONSIDERATIONS

The coronary arteries, or branches, or small radicals, may become occluded by reason of diseased arteries, or some condition of the blood in which clotting occurs and plugs the lumen of the artery. Following the occlusion, there is infarction and necrosis of the muscle fibers to an extent depending upon the size and situation of the plugged artery. This necrosis heals and forms scar tissue under proper conditions in about six weeks. The infarction may be so extensive that the entire heart wall may be necrosed and rupture of it occur through the infarcted area. Endocardial disease occurs and there is found upon the valves vegetations which interfere with their function. These vegetations may be bacterial, or not due to bacteria. Ulcers may form upon the endocardium, leaving scars when healed, and interfering with various vascular channels, thus disturbing nutrition of muscle fibers and modifying muscular contraction. In debilitating disease, the heart muscle may suffer certain degenerations. In failing hearts which are dilated, sometimes the blood is so sluggish in the auricular appendages that a clot forms which may be dislodged and fill the pulmonary artery, causing sudden death; or, if it be in the left auricle, a part may be dislodged and carried to the brain or other parts of the body.

One very important thing upon which proper circulation depends is the reservoir of blood from which the cardiac output is delivered. This reservoir is the blood in the superior vena cava, innominate, inferior vena cava, iliac, hepatic and renal veins.[10] This reservoir is shut off from the rest of the venous system by six pairs of valves, at the femoral, subclavian and jugular veins, and will hold 400 c.c. of blood or more, since the vessel walls are easily stretched. The cistern is in free communication with another large cistern, or reservoir, capable of holding 1,000 c.c. of blood when full, which is the portal system of veins and the liver. Alterations in pressure in the abdomen or thorax vary the venous pressure and affect the heart's output.

The diaphragm, by its rhythmic contraction, its tonus, its position,[11] has a particularly important part in the maintenance of normal function of the heart and circulation. For every sudden demand upon the circulation, there is a reservoir of blood to meet the emergencies, and a diaphragm to increase intra-abdominal pressure and force blood from the reservoirs to the right side of the heart.

It must be stated here that increase in respiration is reflex action and is not initiated by muscular work.[12]

In congestive heart failures the venous reservoirs are overfilled, the venous pressure at the right side of the heart is greatly increased, the heart muscle is unable to move a sufficient quantity of blood, the diaphragm loses tonus, the position of the heart is elevated and its transverse diameter increased, and the vital capacity of the lungs lessened.

Hydrostatic factors are the quantity of blood, etc. Normally, this amount is determined to be 8.8 per cent of body weight. Roughly speaking, in a man weighing 150 lbs., 1.5 gallons is blood. When water is drunk in 1,000 c.c. quantities, there is a dilution of the blood by 3½ to 4 per cent.[13] The heart and blood vessels must accommodate this increase in total blood volume and do increased work in excreting it. When hypertonic saline solutions are taken, the same thing occurs. So one infers when large quantities of food are taken, the blood volume is diluted, the blood vessels and heart must accommodate the increase, and subsequently do increased work in order to excrete the waste products, carry the nutrition from digested foods to various parts of the body, and return the blood volume to its normal. There is then a normal variation to pressures, vessels, heart size, and blood volume.

Increase of fluids in heart disease is drowning the patient without the proverbial straw for him to grasp. The failing circulation cannot excrete fluids properly, because tissue edema and increase in blood volume have depressed the normal cellular function of excreting organs. Withholding fluid from the congestive heart failure is sometimes sufficient to restore it to a competent one.

The rate at which physical work or exertion can be done is the scale by which cardiac and circulatory reserve is measured. The viscosity and concentration of the blood is a factor which permits the trained athlete to endure violent and long-continued muscular exertion. Heart reserve is a variable factor, depending upon the physical training of the individual.

CHEMICAL ASPECTS OF THE CIRCULATION

The circulation is built about the blood itself. This fluid is by weight 55 per cent plasma and 45

per cent corpuscles. The corpuscles contain hemoglobin which combines with oxygen in the lungs, one atom of iron to two atoms of oxygen, under tension of 100 mm. of Hg. This oxygen is given up within the tissues where needed at a much lessened tension—19 mm. Hg. The dissociation pressure varies from 100 to 19 mm. Hg. along the blood route. The things which alter the combining power of oxygen with hemoglobin so as to change in the dissociation curve of oxygen are: Presence of inorganic salts, hydrogen ion concentration (CO_2 tension) of the solution, temperature.

In acidosis there is an increase in H ion concentration of blood, breathing is increased, cyanosis is common because oxygen diffusion is interfered with, heart action is increased. In alkaloses there is a decrease in H ion concentration, breathing is decreased, and oxygen tension is raised. The physiological balance of these things permits the normal delivery of oxygen to tissues of the body.

There are certain salts within the blood clinically so fashioned that the blood resists change in reaction to acidosis or alkalosis. These are called buffer salts.

In chronic heart disease these factors of respiratory exchange of CO_2 and oxygen are important because, if the CO_2 in the blood is low, breathing is consequently increased, and alveolar ventilation is increased because of excitement of the respiratory center by inadequate oxygenation of the blood (anoxemia[15]).

The endocrine glands are interesting in association with the function of the circulation because of the effect that under- or over-activity of certain of these glands have upon the circulation. The most definite action upon the heart and circulation is the toxic effect of the over-active thyroid gland. This causes an irritability of the cardiac muscle and a too rapid heart rate, sometimes eventuating into an hypertrophied heart, cardiac irregularity, fibrillation, and heart failure with dilatation.

The adrenal glands are presumed to have an effect in maintaining the tone of vessels and muscle fibers of the heart; but proof that this occurs has not been forthcoming. We know that epinephrine when injected causes a prompt pressor effect. But the effect of the hormone within the body has not been proven.

Neurologically, the circulation is exceedingly complex. There is a neurological control of the heart—its rate, its rhythm, its volume. There is a neurological control of the blood vessels—their dilatation, contraction, and the pressure within them. This system is delicately balanced and perfectly automatic. There are psychic factors which enter into the reflex control of various parts of the circulation. The most specific action upon the heart beat is by way of the accelerator nerve which increases the rapidity or strength of the heart beat; important also are the inhibitory nerve, which slows the heart rate, and the depressor nerve, which lowers blood pressure through the vaso-constrictor nerves and vaso-dilators that go to the vessels.

These types or classes of nerve fibers are related to the various other nerve fibers whose relation to the circulation is secondary, namely, those receptive fibers conducting sensations of cold, heat, pain, pressure, etc.

Hypertrophy of the heart occurs from an imbalance of the load between individual chambers of the heart, such as from valvular failure or whatever increases the resistance against which auricle or ventricle must work. Probably the normal heart does not hypertrophy,[16] but it does grow concentrically with muscular growth of the rest of the body. When hypertrophy occurs, it is brought about by enlargement of the individual muscular fiber and not by a numerical increase.

Cardiac dilatation is caused by strain or stretching muscle fibers beyond the point of physiological recovery. It is due usually to strain superimposed upon damaged muscle from infection or the products of infection. Sometimes it is the result of diseased muscle which is subject to improper amounts of food and fluid, or degeneration.

Myocarditis is wholly a pathological diagnosis although this term has a wide usage, clinically. It means inflammatory damage to the muscles of the heart sufficient to interfere with function, though sometimes the term is broadly used to mean any departure from normal muscular reaction of the heart. It may be produced by infections, toxins, degenerations and nutritive disturbances.

Endocarditis usually begins at the valves of the heart and disturbs the proper apposition of the valve in question. There may be found vegetations or thickened deposits, bacterial or non-bacterial; ulcers may form upon the valves, and fibrin may

be deposited with scarring of the valve. The leaves of the valve may become adherent, in part narrowing the lumen of the valve. The lining of the heart may be attacked and the vascular orifices partially occluded. Endocarditis usually results in hypertrophy or dilatation of a chamber of the heart, or both, eventually causing some type of heart failure.

The degenerations are those due primarily to conditions arising outside of the heart itself—usually infectious diseases and toxins therefrom. Diphtheria or scarlet fever may cause necrosis of heart muscle, or hyaline degeneration of the fibers. Brown atrophy may occur as a result of age. Fatty degeneration or accumulations of fat droplets in the sarcolemic discs occurs in the course of infectious disease.

As a result of age there is an increase in syncytium, and a stiffening of the heart, which impairs its function. Fragmentation of the fibers occurs, and probably represents a terminal agonizing stress of heart muscle.

The most common congenital malformation[17] is persistent ductus arteriosus. This duct unites the arch of the aorta beyond the origin of the three main vessels to the left branch of the pulmonary artery. In the fetus it carries blood from the pulmonary artery to the aorta. The duct closes at birth and later atrophies. Sometimes this duct remains open and blood flows through it continuously from aorta to pulmonary artery, giving rise to a harsh, loud systolic murmur, accompanied by a thrill. The defect causes no appreciable enlargement to the heart, but occasions dilatation of the pulmonary artery.

A bicuspid aortic valve is found frequently; it is not diagnosable.

Coarctation of the aorta is a defect due to shrinkage of the ductus arteriosus, constricting the aorta as by a hand at the point where the ductus arises. Arteries proximal to the constriction may become dilated; higher blood pressure is the rule in the brachial vessels. In this congenital defect ventricular enlargement is common. The average life of these individuals is about 30 years.

Open foramen ovale occurs in 20 to 30 per cent of all hearts. Patency or defective cardiac septum is much more rare. This defect does not give rise to symptoms, so far as known. Defective interventricular septum occurs and permits mixing arterial and venous blood; usually this defect is associated with others, as malposition or transposition of the great arteries. The vessels are in a general way subject to the same type of pathological process. Arteriosclerosis is the end process of arterial disease. All the arteries in the body are not uniformly affected. There may be only the arteries of the kidney affected, or only those of the brain. The sclerosis is usually confined to one location, and, as age advances, the site of the body that suffers is that in which the arteriosclerosis has developed. The cause of arteriosclerosis is unknown.

Harbitz described acute arteritis as a distinct disease entity. He discovered in localized points of the carotid artery acute inflammatory processes, caused by sterptococci. This he believes the origin of most arterial thickening.

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ARRHYTHMIAS.*

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The term arrhythmia is used to denote changes in the frequency and in the manner of heart beats, and should not be applied in its strictest sense, for the cadence may be regular and coordinated, yet be decidedly abnormal. To try to cover the subject of arrhythmia in detail would be a task beyond the scope of this paper, so an attempt will be made to present what is frankly a brief review of the irregularities of the heart from the viewpoint of the general practitioner.

Cardiac irregularities may be roughly divided into several classes, both as to cause and effect. They may be generalized as exhibitions of increased irritability, as in extra-systoles, or as perversion of function, as in fibrillation, or as inhibition or cessation in the diminishing ability to transmit impulses and the final permanently complete heart block. Irregularities produced through disease of the *conducting* system show results through irregularity in the *contracting system.* A perfected state of function is regular equilibrium between the two systems, which gives a resulting rhythmic contraction of the main mass of the myocardium. Excessive irritability may produce exhaustion in the contracting system, as seen in paroxysmal tachycardia where the main mass of cardiac muscle may be made to contract so fast that it cannot perform its function, and, without rest, may dilate or cease contraction from sheer exhaustion.

Irregularities may exist in single conditions, but it is possible to have two or more present together. The practitioner is often called upon to exercise a nicety of judgment to determine whether or not an acute arrhythmia is due to some acute or chronic intoxication, or to a serious myocardial disturbance. Careful inquiry into the past and present cardiac history is often enlightening. There are many times that a decision cannot be reached, and here is where the information gained from an electrocardiograph is of valuable assistance. As this phase of gaining knowledge is beyond the usual facilities of the physician out in the field, these cases should be referred for this examination.

The usual classification of arrhythmias is as follows:

Sinus Arrhythmia: This is ofttimes referred to as respiratory or as juvenile arrhythmia, because of the marked respiratory influence, and is more often found in children. It depends on changes in control of the sino-auricular node in which effect of vagus influence is important. It may be found after use of digitalis and after pneumonia, and, when it occurs with slow pulse rate and low blood pressure, may be responsible for syncope. It is hardly to be considered serious in the adult, and is not considered pathological in the juvenile. No treatment is necessary and it should not be regarded as an indication for lessened activity. Attention is called to it mainly to stress that it should not cause alarm.

Extra-Systole: This is the most frequent of the arrhythmias, and the one that worries the patient most, as the sensations resulting may be very annoying. It is a premature contraction, which is understood better when one remembers that a stimulus strong enough to set up a contraction is answered by the heart with a maximal contraction. Another property of the heart muscle is that it possesses a "refractory phase," in which it answers only to very strong stimuli or is not excitable. An extra-ventricular impulse, causing contraction, will anticipate the next regular impulse which arrives in the refractory phase, and hence does not contract, causing the wasting of an auricular impulse. Until the next regular impulse arrives in the ventricle there will be the usual interval of rest, and hence diastole will be longer than normal, the period of disturbed rhythm equalling two cycles of the usual, with occasional exceptions. Of this irregularity there are several types which consist of the sinusal, auricular, auriculo-ventricular, and ventricular extra-systoles, but they will not be considered in detail. Extra-systoles occur at any and all ages, but are more common after fifty. They may be found under a variety of conditions, and may be lifelong without any apparent disease or impairment of the heart ac-

*Read as part of a Symposium on Heart Disease before the Southwestern Virginia Medical Society, at Marion, Va., March 23, 1934.

tion. They are found in debilitated and neurasthenic patients with irritable weakness of the heart with palpatation. They may be found in toxic conditions, and after use of tobacco, caffein, nicotine, atropine, certain foods, and may be provoked by digitalis. They are often discovered in flatulence, and are influenced by changes in blood pressure and changes in posture. They are often found after emotional stress. If found in organic heart disease, it is more often of myocardial origin, and will be found after rheumatic endocarditis. The significance of their presence is not always easy to determine, but it has been termed *adult* arrhythmia in contrast to sinus arrhythmia, because of the age incidence. The condition may be temporary, but should never be regarded lightly, especially if the patient is over fifty years old, as it is sometime the forerunner by two or three years of an auricular fibrillation. Valuable information is given in the cases worked out by the electrocardiograph. The sensation provoked by an extra-systole causes a twofold reception on the part of the patient, the first element being the extreme consciousness of the heart beat, and, in turn, the element of fear that results. The descriptions given of these sensations vary greatly with different patients, but they usually describe a feeling of "flopping" or "twisting" when the heart beats, and in the momentary pause is born the fear that cardiac motion has stopped. These may vary from being scarcely perceptible to a choking sensation that provokes a slight cough. At times these spasms may simulate angina pectoris in symptoms enough to cause confusion in the diagnosis. If one can alleviate these symptoms, one is always assured of a grateful patient. Treatment in many instances depends simply on removal of a known cause. If it occurs after the administration of digitalis, discontinuance will give relief. If the cause is flatulence or indigestion, it is cured when these underlying conditions are relieved. Those provoked by emotional stress are relieved by sedatives, particularly phenobarbital in small doses, and are often cured by exercise provided that the myocardium is healthy. Digitalis for the condition itself is never indicated. In other cases the treatment is entirely symptomatic, as there is no specific therapy. Relief from stress, grief, excessive fatigue, and sometimes avoiding the use of tobacco will be needed in individual cases. An acute attack is sometimes helped by the administration of atropine, and the prolonged cases will occasionally be given prompt relief by quinidin sulphate in doses of two to five grains three times a day for a short period. This drug should never be used unless the patient is under careful observation, and should be discontinued if there presents any evidence of dilatation.

Paroxysmal Tachycardia is characterized by attacks that begin and end very abruptly, during which the pulse rate may be from 130 to as high as 200 to 300. The paroxysm is usually ushered in by a sensation of a thumping of the heart that invariably attracts the attention of the patient, and the rapid heart beating then begins. During the attack, while the rate is extremely rapid, the heart beats are energetic, often violent, and the beats occur with watch-like regularity. In severe attacks that are prolonged the heart sounds become muffled, and murmurs will disappear during the attack. This will often obscure a diagnosis of organic heart disease from signs found during an attack. If the attack is excessively severe and prolonged, the pulse diminishes in volume, and may finally become imperceptible, the terminal stage being cardiac dilatation from a prolonged paroyxsm, ending in exhaustion. Blood pressure may be normal or somewhat lowered in the usual attack, and a decided fall in pressure is indicative of impending heart failure. The appearance of the patient may be deceptive, but, as a rule, there is a pallor over the face, which may extend to the mucous membranes and gradually over the entire body. There is also an expression of weariness and anxiety which is very noticeable, in spite of the fact that some patients will attempt to continue with their occupations. There may be a sensation of vertigo, faintness, or even syncope, and sometimes profuse sweating, diarrhea, polyuria, and other vasomotor or sympathetic disturbances may occur. Thoracic pain and gastric distress may also be had. The attacks may last only a few seconds or may extend over a period of hours or even days. There has been noted that in some cases the attacks are spaced with regularity, the interval between being a definite period of days, weeks or months, having a tendency to closer intervals when the condition has been of long standing. There is often no apparent cause, but it may result from exertion, emotional stress or digestive disturbance. They may occur at any age but are found more frequently in young adults. One should always be suspicious of an underlying myocardial condition, and, if not

present in the earlier attacks, should be on guard for its appearance later on. Sometimes little will be found on physical examination, except on ascertaining the rate by auscultation the heart sounds appear short and sharp, very much like fetal heart sounds. In the more severe spells that have been prolonged, aggravated signs may be present, such as cardiac enlargement, passive congestion with bloody sputum, cyanosis, edema, and enlargement of the liver with generalized abdominal tenderness. The history of previous attacks is important, and here, again, electrocardiographic study is invaluable. The outlook may be good, but is always uncertain, there being especial danger where there is evidence of a disturbed circulation present. The condition is compatible with long life, but it is thought that paroxysmal tachycardia will eventually transform into complete arrhythmia or auricular fibrillation. In treatment the patient should be warned to attempt to forego the things that apparently provoke the attacks, such as exertion, digestive disturbances, etc. When these fail to prevent, they are sometimes stopped in the beginning by taking slow deep breaths with the arms extended, or by swallowing several times, especially something in solid form that is a little difficult to swallow. Tickling of the pharynx to the point of nausea has also been recommended. Compression of the pneumogastric nerve, especially the right, has been known to halt the attack in some cases. In the spell that persists, rest in the most comfortable position, forced liquids, sedatives, and sometimes alkalies, are indicated. An ice-cap to the precordial region is often beneficial. Small doses of morphia or phenobarbital are often of benefit. In severe cases about the only drugs found worthwhile are strophanthin or ouabain as intravenous injection. The latter is to be used in a dosage of 1/240 grain every twenty-four hours. The treatment is otherwise entirely symptomatic, with improvement of the general health in between attacks if possible.

Auricular Flutter: This condition is not common, and is sometimes very difficult to distinguish from paroxysmal tachycardia except with the aid of an electrocardiograph. It is nearly always associated with heart block, is more often found in advanced age, more common in males, and usually is associated with arteriosclerosis and more or less severe myocarditis. It usually responds well to digitalis, and, in fact, some authors say that digitalis is a specific for this condition.

Auricular Fibrillation, or complete arrhythmia is distinguished by a constant and relatively moderate acceleration of the beats up to 100 to 120, by a variation in amplitude, and by the length of pause that separates them. It is supposed to be one of the commoner forms of arrhythmia, and is said to compose 40 per cent of the cardiac irregularities, but this percentage is much higher than the experience of the average general practitioner will justify. It may be seen in cases with no apparent cardiac disease, but, as a rule, it appears late in cardiac damage, especially a severe myocarditis, and is often seen in the later stages of a mitral stenosis. Many of the cases, when it appears between the ages of 30 to 40, will present a rheumatic history, the age incidence being from 50 to 60 or later in the nonrheumatic group. It may prove to be of short duration, but the majority are prolonged, going into permanent complete arrhythmia. Symptoms depend largely upon the associated conditions, and in the more severe cases are those of a marked myocardial failure. A rapid ventricular rate increases the distress, and the more rapid the rate the greater is the irregularity. Prognosis should always be guarded, but it is known to be compatible with long life, especially in those cases where the morbid phenomena are limited to the auricle, leaving the ventricle unimpaired. The prognosis is largely determined by influence of treatment. Digitalis should always be instituted, there being an especial indication for its use, as it acts by blocking weak ineffectual impulses. The dosage is decidedly individual, and is determined only by observation. In spite of this treatment the irregularity will often persist, and is relieved more or less frequently by the administration of quinidin, the results obtained varying with the degree of associated cardiac pathology. Most authors caution against the use of quinidin without a preliminary course of digitalis, and say that it is contra-indicated in an active endocarditis, a secondary endocarditis, fever, and the presence of a partial or complete heart block.

Heart Block: This group is caused by a delay in passing, or the blocking off more or less completely, of the impulses, and may occur at any age depending on the cause. It frequently gives a history of infectious diseases, especially rheumatic

fever, diphtheria, influenza, or penumonia. Syphilis may be a factor, as well as any form of myocarditis, either acute or chronic. Temporary block to a varying degree may be caused by the injection of digitalis, adrenalin, etc. Symptoms are variable and are also influenced by associated conditions. Some patients complain only of being dizzy, but weakness with fainting is more common. On examination, by comparing the cardiac contraction by auscultation with the pulse rate, it is evident that many extra-systoles are occurring that do not send impulses to the wrist, or it may be that only part of the beats are dropped, due to partial heart block. This condition should always be kept in mind when one decides to employ massive doses of digitalis. *Stokes-Adams Syndrome,* which accompanies some cases of heart block, should not be confused as being synonymous, and is characterized by three clinical features. There is a slow pulse, which may be permanent, or sometimes falls in paroxysms to 40, 20 or even lower. There may be transient vertigo and syncope with cerebral anemia, and pseudo-apoplectiform attacks or epileptiform seizures. There may be visible auricular impulses noted in the veins of the neck. In heart block there are usually senile manifestations associated with arteriosclerosis, or if found in young adults it is associated with myocarditis or luetic infection. Prognosis is good in infectious diseases, except in rheumatic fever, influenza and diphtheria. In the chronic form the significance is grave, and death may be sudden. In syphilis the treatment is evident, along with rest and general cardiac treatment. Atropine is useful in the type occurring in infectious diseases. Digitalis should be used only with great caution, and massive doses should be avoided. For the syncopal attacks the treatment is entirely symptomatic.

Alternation of the Heart: In this condition the pulse shows alternate strong and weak beats, due to a disturbance in the ventricular systole. It is seen often in very prolonged rapid heart action. It is of very grave significance, especially if found in uremia, pneumonia and severe infections. It is found in lead and strychnine poisoning, and in some patients under the influence of digitalis. Treatment is entirely that of the underlying condition, with prolonged and thorough rest.

Ventricular Fibrillation: This condition is more or less of academic interest, as it is incompatible with life.

Cardiac arrhythmias are important because they are often the first indication of an existing or an impending cardiac pathology. One cannot help being impressed when considering these conditions with the part played by the myocardium in *all* irregularities. Even in the simpler form of respiratory arrhythmia, which is not considered pathological in children, it is noticeable that it appears in adults with suspicion of a weakened myocardium. This tendency of myocardial weakness seems to progress as the more severe forms of arrhythmias are considered in order of severity, until the stage that is incompatible with life is reached. The seriousness of the irregularity seems to depend largely upon the amount of underlying cardiac damage or associated conditions.

The prognosis at best should always be guarded until more complete information is available both from prolonged observation and more detailed examination. In this latter respect electrocardiographic study is invaluable, but beyond the scope of the general practitioner who possesses only ordinary equipment. Emphasis is directed to the fact that treatment now existing shows slight indication of anything specific, and there does not exist a standardized therapy. More often treatment is indicated for the underlying, associated, or causative factors.

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509 Medical Arts.

CONGESTIVE HEART FAILURE.*

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During the past hundred years, there has been a very decided decline in the mortality rate, so that life expectancy has increased from thirty-eight to fifty-eight years. This improvement has been due largely to the prevention and better treatment of the infectious diseases. For instance, tuberculosis in 1900 had a death rate of 201.9 per hundred thousand, and heart disease 123.1 per hundred thousand. In 1924 these figures had changed until tuberculosis was down to 90.6, and heart disease up to 178.4. In 1929 heart disease had increased to 210.8 per hundred thousand. The United States Bureau of Census in 1931 listed 253,985 deaths as caused by heart disease, which is one and one-half times that of influenza and pneumonia (all forms), its nearest competitor, and the deaths from heart disease are steadily increasing. While infectious diseases are steadily declining, the degenerative diseases are almost without exception gaining consistently, and heart disease may well be called the "king of all diseases." Therefore, serious consideration of this problem is appropriate.

The heart muscle, like any other muscle, requires glucose, insulin, and oxygen for its proper work, but it is less tolerant of oxygen debt and more sensitive to lactic acid accumulation than the skeletal muscle. It also may be well to remember that it appears impossible to do permanent harm to the normal heart muscle by any load placed upon it. The vital capacity of the lungs and the sensitivity of the respiratory center to changes in hydrogen ion concentration are safety valves that will stop the whole body before the normal heart muscle is damaged. Acute dilatation of the heart, then, is due either to anoxemia or excessive load on the already damaged heart. Acute dilatation in febrile infections occurs only in the previously damaged heart except in the immediate antemortem state when anoxemia develops.

Heart failure or circulatory failure, as Warfield[1] has admirably pointed out, may well be considered from two points of view. It may be central or peripheral, but too sharp a line of distinction cannot be made between the two. He quotes Wollheim who has divided cardiac decompensation into plus and minus. The plus are those cases in which there is definite increase in blood volume as found in the hypertensives. They are by far the most common, and show a breakdown as a result of excessive strain from the hypertension or in aortic insufficiency or mitral stenosis. The common features are dyspnea, orthopnea, edema, distention of the neck veins, and cyanosis. They are the type that insist on sitting up with their legs hanging down instead of lying flat in bed, thereby reducing from active circulation from 400 to 1,000 c.c. (Wollheim) of blood by filling the subpapillary skin plexuses of the legs.

The chronic minus cases with a definitely decreased blood volume are seen where there is a primary disturbance in the oxygen exchange of the lungs, as in pulmonary stenosis or emphysema or thyrotoxicosis. The acute cases are seen in the toxic infectious diseases and circulatory shock.

Treatment in the plus decompensation cases is aimed at taking the load off the heart by such means as venesection, diuretics, limited carbohydrate diet, digitalis or strophanthin. For the associated sluggish coronary circulation and anoxemia and consequent secondary dilatation, oxygen, glucose and insulin administration is logical.

In the congestive heart failure of the plus decompensation type, Stone[2] and his associates of Texas University discuss the problem of edema seen especially in those cases caused by an increase in filtration through the capillaries resulting from increased venous pressure accompanying congestive failure. They point out that increased permeability may be due to anoxemia or nutritional disturbance in the cells. Impaired renal function may be a very important contributory cause of this edema. The edema itself renders the circulation through the tissues more difficult, thus throwing an additional burden upon the already insufficient myocardium. It diminishes the diffusion of oxygen (Harrison and Pilcher[3]) with a secondary and compensatory in-

*Read as part of a Symposium on Heart Disease before the Southwestern Virginia Medical Society, at Marion, Va., March 23, 1934.

crease in blood volume. At the same time carbon dioxide increases in the tissues. Edema may be a symptom of congestive heart failure. Secondarily, by throwing an additional load on the heart, it may further cause greater heart failure. So the patient with congestive heart failure at rest may suffer both from general circulatory inefficiency and myocardial insufficiency.

Relief of the cardiac insufficiency, then, demands our best efforts to remove the edema. The edema that remains after bed rest and digitalization calls for a consideration of the various diuretic drugs.

Christian[4] says theophylline (theocin) is the most efficient of the xanthine diuretics for oral administration. Doses of five grains, three and four times daily for two to three days, are recommended for the average person. More than that may cause nausea and vomiting. Theophylline ethylene diamine (or thephyldine) given intravenously is considered the most efficacious and safest of the xanthines. The time of onset of diuresis is usually within an hour, reaching the maximum within three or four hours, with the urine secreted at a rate of about 7 c.c. per minute. The complete effect is usually gone before twelve hours.[2]

Mercury as a diuretic in heart disease without kidney damage has been recognized a long time, as attested by the popularity of Guy's pill, but with much kidney damage they may well be omitted. Novasurol is considered the most powerful of any diuretic yet introduced, but, because of its possible toxic effect, such as stomatitis and hemorrhagic nephritis, it has been almost entirely displaced by salyrgan, which is not wholly without possible harmful effects, but usually can be given at frequent intervals over a period of months. Its diuretic effect is slower than the xanthin products, but is supposed to last longer—sometimes even into the second day. The average time of onset after intravenous dose (1½ to 3 grains) is two to three hours, with the maximum 7½ c.c. per minute reached in five to six hours. Since the xanthines produce diuresis by a predominant increase in glomerular filtration, and the mercurials through the tubules, these authors report an increase of diuresis by the alternate use of the two medicines, giving one as soon as the base line was again reached after the first one, and they reported a decided increase of diuresis.

Ammonium chloride in large doses (1½ to 2 drams a day) is a variable and uncertain diuretic. Its effect, which is supposed to be produced by the acidosis following its administration, is best obtained with a salt poor diet and a restricted fluid intake of 1,000 to 1,500 c.c. per day. The combined effect of ammonium chloride and salyrgan has been reported to produce a marked diuresis.

Urea by mouth has been recommended, such as one to two ounces diluted in water or fruit juices, and may be given over a period of two or three years if there is no renal damage. Most effect is reported when edema is marked. The diuresis is probably accomplished by the filtration of increased amounts of urea, with the consequent transportation with it through the kidneys of large amounts of water.

The procedure of mechanically removing fluids by making slight punctures through the edematous skin is an old one, but not much discussed these days. Are we not leaving out a very valuable and simple method in appropriate cases? I recently tried it on a moderately edematous case, and the adjacent swelling diminished rapidly. Dr. Lawson told me yesterday of one patient from whom he had removed about two gallons of fluid in one day by this method. By keeping the puncture holes open, he was able to continue the drainage over a period of several weeks. This is much facilitated by having the feet hang down and the punctures in the more dependent areas.

The diastolic filling of the heart is dependent upon the venous return. Under normal conditions, this is sufficient for proper ventricular contraction. The venous pressure necessary for this venous return is dependent on the vasomotor tone of the peripheral vessels as well as the heart. The amount of blood that is in active circulation is influenced much, of course, by the tone of these peripheral vessels. While it has been shown that the plexus of vessels in the skin is probably the most important depot for holding blood not in active circulation, the splanchnic area is next. This brings up the question, is the failure of the heart the initial circulatory symptom in these cases of minus decompensation as seen in serious infections? In fevers there is low blood volume due to loss of fluid into tissues. These patients lie comfortably flat in bed. There is no distention of neck veins, the blood is

concentrated, there is loss of chlorides in the blood, venous pressure is low, and the condition is quite comparable to that known as secondary shock.[1]

In these infections, the poison resulting from the infections increases the osmotic pressure of the tissues, thus drawing fluid from the capillaries and reducing blood volume. The catabolic changes of the tissues increase the affinity of the tissues for water, reducing blood volume. Because of this, diastolic filling is profoundly disturbed. To compensate, the heart rate speeds up; its nutrition is disturbed and the so-called heart failure thus may be due entirely to the peripheral disturbance. Recovery from the infection then means a return to the normal blood volume, normal chlorides which are so essential for proper phagocytosis, normal concentration of blood and normal venous pressure.[1]

For the acute minus decompensation as is seen in the seriously ill patients of infectious fevers, the treatment is more like that for secondary shock. Digitalis is claimed to decrease blood volume, so it may be said to be contra-indicated except with associated auricular fibrillation. The vasomotor drugs for increasing the circulating blood volume are indicated. Wollheim, from his experiments, claims that strychnine sulphate increases this blood volume by its effect on the vasomotor system and it may be the most useful drug at hand. Warfield has advocated large doses of it, as much as 1/15 of a grain every hour or two. Caffein and camphor are also reported to increase blood volume and in addition stimulate the vaso-constrictor center. Intravenous doses of saline or glucose or a combination of the two with adrenalin helps much. The introduction of fluids intravenously is the most logical and satisfactory method of increasing blood volume. Since a normal individual loses about three liters of fluid daily[1]—and in the presence of infection mild dehydration may be serious—these fluids should be given perhaps several times a day. Because of the fact that the saline and glucose fluids do not remain in the blood long, their effect is not lasting. To offset that, blood transfusions offer a better solution. This blood, which contains colloids that will hold the blood in the vessels longer, maintains the increased blood volume a longer period of time. In addition, it introduces important ions, such as Ca, Na, K., and adds oxygen carrying blood cells. The saline helps to restore the blood chlorides, thus increasing the phagocytic power of the blood, while the glucose, of course, makes readily available more nutrition for the tired heart muscle. Generally a sensible treatment, then, would suggest for the ordinary case about 500 c.c. of blood every three or four days with daily injections of glucose, about 10 per cent, with saline, about 3 or 4 liters per day, which should be given slowly and reduce the possibility of "speed shock." Another point to emphasize is that the average individual can take about 75 gms. glucose per hour from the circulation, so that concentrated glucose solutions given at a rate faster than that would probably lose a considerable amount of the sugar by filtration through the kidneys. While in hospitals a concentration of more than 10 per cent may rarely be needed or advised, there may appear emergencies in the homes where a concentration as much as 50 per cent may safely be given in small amounts and slowly. I have many times found it very handy in diabetic emergencies in the home. I have seen no injury to the vein used, and, even if so, that is a small matter for consideration if a life may be saved by it.

Remember that the heart muscle demands a good supply of glucose for its action, and in diseased conditions where there is a disturbance of the blood supply to the muscle through the coronary circulation, such as in the presence of infection or particularly in the cases of minus decompensation, special emphasis must be put on supplying sufficient glucose to that heart muscle, with oxygen and insulin added as the case may indicate.

In our concern for the failing heart, let us not forget that this failing heart may be due to, and many times is secondary to the peripheral circulatory failure, and emphasis, therefore, must primarily be put on increasing blood volume, increasing blood chlorides, and raising the venous pressure. Our chief medicines are those that stimulate vaso-constriction and fluids introduced to increase and maintain proper blood volume.

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CORONARY THROMBOSIS.*

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Coronary thrombosis, as we all know, is due to sudden occlusion of one of the main branches of the coronary arteries. The right supplies the right ventricle and auricle and the posterior part of the inter-ventricular system. The left supplies the left auricle and left ventricle.

ETIOLOGY

Etiology is not definitely known. The majority of cases occur between 50 and 60 years of age. Males are much more frequently affected than females. Hypertension is present in a large percentage of cases; although tobacco, exercise and food are not thought to be causative agents.

SYMPTOMATOLOGY

Pain is the most constant symptom. It is sudden and of great intensity, and persists for several hours. It is retrosternal and is often referred to the left shoulder and arm. It is not relieved by nitrites, but requires large doses of morphine.

The patient's skin is pale and the lips may be slightly cyanotic. The respiration is rapid. Often there is profuse sweating and vomiting, and there may be suppression of urine. They are very anxious and fear impending death. There is a marked drop in blood pressure and a leukocytosis. Rales are heard at the bases of both lungs, suggestive of pulmonary edema. The pulse varies a great deal in different cases. It may be very rapid and weak, and it may be slow, suggestive of heart block. In a few cases the pulse is so nearly normal that it may be very confusing and mislead one as to the true nature of the condition. The temperature is usually elevated to a slight degree during the first twenty-four or forty-eight hours. One to two degrees is, as a rule, as high as it goes, and this may persist for several days.

An examination of the heart does not reveal, as a rule, the changes that one would expect from the severity of the symptoms. In some cases, to be sure, there will be auricular fibrillation, or paroxysmal ventricular tachycardia, but the most frequent finding is a heart with feeble sounds and occasional arrhythmia. After a few days a pericardial friction rub may be heard.

Electrocardiographic changes are not sufficiently positive for several days to rely on this method for a positive diagnosis in the early stage.

DIFFERENTIAL DIAGNOSIS

Coronary thrombosis may be confused with angina pectoris. The pain, although similar in location and other respects, is not relieved by nitrites, and it persists for several hours, while the pain of angina seldom persists for more than a few minutes before relief is obtained. Thrombosis usually occurs while the patient is at rest and not undergoing any unusual exercise. Forty per cent of the cases of angina later develop coronary thrombosis.

Acute surgical conditions of the abdomen, such as gall-bladder colic, acute pancreatitis, perforated gastric or duodenal ulcer, have to be considered from the symptoms present. The absence of distention and localized areas of tenderness and muscular rigidity, together with symptoms referable to the heart, are usually sufficient to rule out an abdominal condition, although it is not unusual for some of these cases to go to operation.

Pneumonia and pleurisy are sometimes suspected, especially if the patient happens to be convalescing from a respiratory infection when the attack begins. The rales are usually heard at the bases of both lungs in thrombosis, and the other physical signs of pneumonia are absent. Spontaneous pneumothorax and pulmonary infarction may cause pain and other symptoms similar to thrombosis, but, as in pneumonia, a careful physical examination will eliminate them.

COMPLICATIONS

According to Ross Patterson,[1] important complications are as follows:

1.—Rupture of the heart, occuring from the fifth to fifteenth day.

2.—Rapidly developing acute congestive heart failure with enlargement of liver and spleen.

3.—Embolic phenomena after the first week, the

*Read as part of a Symposium on Heart Disease before the Southwestern Virginia Medical Society, at Marion, Va., March 23, 1934.

site being the brain, lungs, kidneys, spleen or extremities.

4.—Suppression of urine.

5.—Disturbance of the heart beat, such as heart block, auricular fibrillation, paroxysmal ventricular tachycardia, and ventricular fibrillation.

PROGNOSIS

The average length of life after an attack is between two and three years. One case has been reported that lived for eighteen years. Cases having hypertension and marked arteriosclerosis have a poorer prognosis. About 40 per cent have a recurrence at a later date.

TREATMENT

As soon as the diagnosis is made, the patient should be given ¼ grain of morphine. This should be repeated at half hour intervals until the pain is relieved. It may be necessary to give as much as 1 grain within an hour or two. Glyceryl trinitrate should not be given. If the shock is great and a collapse extreme, epinephrin should be given.

The patient should be at absolute rest, warmth applied and fluids forced. Sweet fluids, such as lemonade, milk and orangeade should be given freely. Dextrose solution has been given intravenously with good results, 50 to 100 c.c. of a 50 per cent solution to be given daily.

Digitalis should only be given to cases of persistent auricular fibrillation.

Oxygen inhalation with the patient in a tent is very beneficial to those cases of marked dyspnea and cyanosis.

Caffein sodio-benzoate is also used for certain cases who have respiratory distress.

Rest in bed should be continued from four to six weeks.

Not infrequently glycosuria is discovered following an attack of thrombosis. This should either be overlooked for the time being, or handled by means of regulating the diet. Do not give insulin. It has often caused fatal results.

If a four plus Wassermann is discovered following an attack, no intravenous medication should be given. After two or three weeks it is safe to give potassium iodide and mercury by mouth.

Levine[2] says epinephrin is of great value where a complete heart block develops.

Cases of paroxysmal ventricular tachycardia should be given sufficient doses of quinidin sulphate to slow the heart. Start with 5 grains and increase every four hours until results are obtained. The dose may be increased to 15 grains.

When the patient is sufficiently convalescent to get out of bed, he should be allowed to sit in a chair fifteen minutes to one-half hour the first day. The time he is allowed out of bed should be gradually increased for the first week until he has remained up most of the day. He should be cautioned against any undue physical or mental exertion. He should be advised against violent emotional upsets, and, if possible, train himself against violent outbursts of anger. All foci of infection should be removed.

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COLLAPSE THERAPY IN PULMONARY TUBERCULOSIS.*

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During the past few years surgery has been rapidly coming to the front as offering us more hope in handling pulmonary tuberculosis, and at the present time much is being said and written about it, chiefly by the surgeons. It is our purpose herein to give some of the reactions of the medical man to this relatively new mode of treatment, bearing in mind that the very youth of the movement necessitates frequent change in those reactions and knowing therefore that they are far from permanent. Recent advances in surgical treatment have made a profound impression upon us and convinced us that

*Read at the sixty-fifth annual meeting of the Medical Society of Virginia, in Alexandria, October 9-11, 1934.

the surgeon does have something quite definite to offer; especially is this true of thoracoplasty.

For some time past every patient admitted to Catawba Sanatorium has been considered for collapse therapy. On October 4, 1934, there were 298 patients in the Sanatorium, of which number 275 were diagnosed pulmonary tuberculosis; 63.6 per cent of the 275 had been given some form of collapse treatment and in many of them more than one form had been used.

In these brief remarks we shall confine ourselves to those methods of collapse therapy that have been used upon our patients sufficiently for us to be familiar with their advantages and limitations, viz., artificial pneumothorax, with or without pneumolysis, phrenic nerve interruptions, and thoracoplasty.

Artificial pneumothorax has been used at Catawba Sanatorium since 1912. It is generally recognized as the method of choice in collapse therapy and is far more widely utilized than all other methods combined. So completely has it become accepted that little is being said about it today, not enough we think in view of the fact that many practitioners are not yet familiar with it in detail. Therefore, a slight digression to bring it to your attention. The technic is quite simple and the requisite skill may be acquired by any physician who will take time to study the method. The apparatus is inexpensive, if home-made, which we think is better than the manufactured, and is easily kept in working order. A special needle tends to insure success and helps in avoiding accidents. Suitable cases are selected on a basis of clinical, physical, X-ray, and laboratory findings. Indications for pneumothorax are: (1) unilateral tuberculosis, with or without cavity; (2) hemorrhage cases; (3) bilateral tuberculosis with slight involvement in one lung and more extensive in the other, especially where one lung is apparently quiescent and the other active; (4) bilateral pneumothorax may be used in a few selected cases where there is cavitation or considerable involvement in both lungs; (5) as a palliative measure to relieve symptoms and prolong life and make the patient more comfortable in some selected cases of extensive bilateral tuberculosis; (6) positive sputum cases, where a partial or complete collapse will probably render the sputum negative. Therefore, it is used variously as a curative or palliative measure, as a means of controlling hemorrhage, or rendering the sputum negative. Suffice it to say that results along all of these lines have been most gratifying.

The accidents to be avoided are comparatively few but can be quite distressing. They consist of: (1) entrance of the needle into a vessel of the lung, producing hemorrhage or injection of air into it, resulting in air embolism; (2) pulling an adhesion loose at its visceral end which allows air to enter the sac from the lung, constituting spontaneous pneumothorax, or allows bacilli to enter the sac, giving rise to intractable empyema; (3) exerting sufficient pressure to cause mediastinal hernia; (4) air embolism from other causes. Obviously any active treatment which is to extend over a period of months will at times demand niceties of judgment. Close observation with repeated fluoroscopic examinations seems to us almost mandatory and this is one of the reasons that we recommend sanatorium residence for these patients, at least for the first few months. When to stop the treatment and allow expansion of the lung is much more difficult to decide than when to start. Ordinarily collapse of the lung should be continued for a period of from six to thirty-six months; some cases can be benefited by a shorter period of collapse than six months, and a few cases will require a longer period of treatment than thirty-six months.

The cause of failure to obtain satisfactory collapse of the lung in these cases is practically always interpleural adhesions. In certain selected cases where this is true we have found internal pneumolysis a valuable procedure in dividing the adhesions to permit collapse. In capable hands much can be accomplished and the risk of accident is slight.

With us phrenic nerve interruption is used as a substitute usually, in place of pneumothorax where dense adhesions obviate any collapse, and in place of thoracoplasty where this operation is not practicable. In addition to these it sometimes alleviates the symptoms in hopeless cases, making more comfortable the patient's last days. In recent years there have been no unusual number of accidents or definitely bad results and we think it has been a worth while procedure. We do not assign to it any great curative value and prefer more active collapse measures when they can be employed, especially if attempt is being made to close cavities. Phrenic nerve interruption can be used to obtain temporary

or permanent paralysis of the diaphragm. Some are recommending almost entirely a temporary phrenic nerve interruption to be followed by a permanent interruption later on if it is indicated.

Up until a few years ago the mortality rate in thoracoplasty was so high that we recommended its use very infrequently, but recently rapid strides have been made in overcoming this and in producing more nearly perfect collapse. It is to be used chiefly for the purpose of closing cavities and only upon patients who have a chance of returning to some degree of activity afterward. Consisting as it does of from one to five major operations, each one potentially fatal, it is to be advised with intimate knowledge of the individual and upon consultation between the man who has this knowledge and the surgeon who is to operate. Correctly handled in properly selected cases, its field of usefulness is broad and the results obtained may be excellent. We are expecting this improved thoracoplasty to become a boon to victims of tuberculosis and think a great deal of credit is due those surgeons who have developed it, sometimes helped by the medical men, often hindered by their skepticism.

Collapse therapy plays an important part in the present-day treatment of pulmonary tuberculosis and every victim of the disease should have the benefit of being considered for it.

Of the means used artificial pneumothorax is most widely applicable and deservedly holds first place. It may be profitably supplemented by pneumolysis.

Phrenic nerve interruption is useful where other measures are impracticable, and at times as a palliative.

Thoracoplasty with its recent improvements adds renewed hope and should be used more extensively. Close cooperation between phthisiotherapist and surgeon is imperative.

DISCUSSION

DR. E. C. DRASH, University, Va.: Dr. Nicholls has given a very clear and concise summary of the present-day concept of the various types of collapse therapy utilized in the treatment of tuberculosis. He is to be congratulated on the splendid showing which has been made in the percentage of collapse therapy being used at Catawba Sanatorium.

It might be interesting to note that I have just returned from a two weeks' study of the method being used in Michigan. The State of Michigan has probably the most efficient system for the study and care of tuberculosis of any State in the Union. Dr. Alexander, of the University of Michigan, tells me that the Michigan State Sanatorium is applying collapse therapy (which includes pneumothorax and all types of surgical procedures for collapse), to 91% of their patients.

Dr. Nicholls has mentioned that the concepts in regard to various types of procedure are constantly being changed and varied. This is probably most striking at the present time in regard to operations on the phrenic nerve. This has gradually changed so that the majority of operations on the phrenic nerve now consist of crushing of the main trunk and resection of the accessory, to produce only temporary paralyses of the diaphragm. There are many cases in which a permanent paralysis of the diaphragm is either unwise or unnecessary. Evulsion of the nerve also presents certain dangers even when a permanent paralysis is desired. The temporary paralyses of the diaphragm may be repeated several times if necessary, or may later be made permanent.

As far as thoracoplasty is concerned, the newer methods permit the closure of far more cavities than could be closed by the older methods. Also the mortality is being tremendously reduced, and the results improved.

The last case Dr. Nicholls discussed is an excellent example of a patient who has been on the cure in various institutions for a period of almost eight years. Thoracoplasty has put that patient on her feet. Eight years in sanatoria is a tremendous economic burden on the State which pays part of the expenses and on the patient's relatives.

The patient is now no longer a burden to the State and her family. She is sputum free and no longer a menace to her people nor a public health problem.

DR. C. P. CAKE, Washington, D. C.: I wish to thank Dr. Nicholls and Dr. Broome for their very excellent presentation of this timely subject. I suppose there is no doubt that there has been no greater advance in the treatment of tuberculosis, since the introduction of the rest cure, than collapse therapy. The surprising thing about it is that although the practicability of pulmonary collapse was demonstrated by James Carson, in 1821, it has been only in the last three decades that this form of treatment has obtained recognition and approval in the treatment of human tuberculosis. Whereas formerly we used to more or less timidly ask ourselves if perhaps we might use collapse therapy in a given case of tuberculosis, I believe today we have to stop and consider if perhaps there might not be some contra-indication for its use.

Now that this method of treatment has been proved to be of benefit, the question arises, at what time during the course of the disease should it be applied? I believe the answer to this is, as soon as possible. Of course, we know there are many cases of early tuberculosis that will clear up on bed rest alone, but we also know there are many others that continue to progress in spite of that bed rest. There is a time in the course of almost every case of tuberculosis that collapse therapy offers hope of benefit. If we allow our patients to continue beyond that stage, we have been

derelict in our duty to them. Then, too, since we have no criteria for determining with accuracy which way a given lesion is going to go—whether it is going to clear up or is going to progress—if we want to do the greatest good to the greatest number we should consider collapse in every case of tuberculosis as soon after the diagnosis has been made as possible.

Another argument for using collapse therapy early is that the earlier it is begun the simpler the methods that will have to be employed to effect a cure. I submit that it is more conservative to apply artificial pneumothorax or phrenic nerve interruption in the early stages of a patient's disease than to expose him to the danger of his disease progressing to a point where only a complete thoracoplasty offers hope, or there is no hope.

Then, too, the economic factor should be considered. Patients have sometimes been condemned to long periods of disability which perhaps might have been shortened by months or years if collapse therapy had been employed in their treatment. Of course, as was said, some patients will get well without anything but bed rest, but we also know that even these patients will get well more quickly if their rest is supplemented by some form of collapse therapy. The economic side of tuberculosis presents a very real problem, and if we can do anything to shorten the period of disability we owe it to our patients and to the community to do so.

DR. DEAN B. COLE, Richmond: I wish to congratulate Dr. Nicholls and Dr. Broome for their splendid presentation of a most excellent paper. I am indeed sorry that so few physicians are present to hear this timely presentation.

During the past sixteen years I have witnessed the evolution, if not the revolution, of the treatment of tuberculosis. As the result of the development of collapse therapy, especially the wide use of pneumothorax, the outlook of the tuberculous patient has changed from an uncertain type of hopelessness to a rather definite, favorable prognosis. The mortality from this disease has shown a gradual and rather constant decline and this alone is worth the effort, but this is just a small part of the story. Thousands of patients who were formerly condemned if not to death, to invalidism or semi-invalidism, are now wage earners and consequently an asset to themselves, to their family, to their community, to their state, and to their country. Also the prognosis has changed from one of the most hopeless to one of the most hopeful of the chronic diseases. Through the closure of cavities, we have been enabled to free most patients of tubercle bacilli and a great many of them of sputum. When this is done, these patients may be at home or at work without endangering the health of those with whom they come in most intimate contact. For this reason collapse therapy, and especially pneumothorax, is one of the greatest of the public health measures for the control of tuberculosis.

Dr. Nicholls' report of sixty-three per cent of patients at Catawba Sanatorium that were receiving some form of collapse therapy is most encouraging. Some sanatoria report as high as ninety to ninety-two per cent of all patients receiving some form of collapse therapy. Time may prove that this percentage is too high, but personally I doubt it. An adequate collapse therapy program will permit patient to be admitted to a sanatorium for a short time, a few weeks, at most a few months, when, after pneumothorax has been successfully instituted and the patient has had sufficient time to become stabilized, he may be permitted to return home under his own physician and his bed at the sanatorium made available for someone else. I also believe that arrangement should be made to re-admit these pneumothorax patients on short notice, or even without notice, should complications arise and necessity demand it. If this can be done, both patient and physician will have a sense of security in handling these pneumothorax patients that is not otherwise possible. Through such a program I believe it is possible to accelerate the turn-over in tuberculosis sanatoria to two or three times its present rate. This is not a theory, but a practice that has already been established at Pine Camp Hospital, and elsewhere. Many of these patients are earning their livelihood in factories, offices, and elsewhere.

For the past ten years we have had a rather intense collapse therapy program, especially concerning the closure of cavities. The success of this program has been made possible through the co-operation of Dr. Frank Johns, who has been willing to undertake operations that were not orthodox, but have since become recognized. I refer especially to apical and upper lobe thoracoplasties for the closure of cavities.

In closing, I would like to add one indication for pneumothorax, which, by thoracic surgeons as standard surgical procedures, Dr. Nicholls failed to mention—that is for the relief of pain. In cancer of the lung I know of no procedure that is even comparable to pneumothorax for the relief of pleural pain. If this is done early, the patient will be saved much suffering. We have followed this procedure for more than seven years and after this experience commend it to be used.

DR. W. E. BROWN, Blue Ridge Sanatorium: I have very little to add to what has been said here today, but I should like to re-emphasize the fact that selective collapse of the diseased portion of a lung gives us the most definitely beneficial therapeutic measure that has been brought out since general rest was demonstrated as the proper method to treat these patients. Also, I should like to say this: that I feel there is possibly a little too much surgery being practiced on some of these cases. I think that the cases should be selected with certain definite points in view. The type of lesion should be considered. If it is of a progressive type, from the X-ray standpoint or from the symptomatic standpoint, or if there is a cavity present, or a softening process going on, I think collapse with pneumothorax is indicated; but I can not bring myself to feel that the early exudative lesion should be collapsed when first discovered. I think that those patients ought to be put to bed and kept under close observation. Their symptoms should

be observed and evaluated; they should have frequent X-ray films taken of the chest; and the progress of the lesion should be carefully noted. If under proper bed rest we note a retrogression of the lesion then we have saved that patient a lot of trouble and grief by not putting him through a surgical collapse. Dr. Nicholls well said that the hardest point is to know when to stop treatment, and I should say that this is true. It is easy enough to decide, usually, when to collapse. But why subject a patient to two or three years of pneumothorax treatment if you find that six to eight or ten or twelve months of rest will get the lesion to a good state of quiescence and enable the patient to go along comfortably and not be a danger to those with whom he comes in contact? I confess that is my policy now. I do not think we have a right to challenge every unilateral lesion until we have studied the case and have come to a definite conclusion as to whether or not this patient will improve without surgical interference.

DR. _____: I should like to ask Dr. Nicholls a question about the age—whether he has had any case over fifty.

DR. NICHOLLS, closing the discussion: The majority of our patients are young adults. The patients range in age from fifteen or sixteen to old age. We have used pneumothorax treatment in patients over sixty.

DRUG IDIOSYNCRASY AND NEUTROPENIA.*

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The literature of the latter part of 1933, and of 1934, abounds in case reports of neutropenia due to various drugs.

It has long been known that various chemicals would depress the marrow function, resulting in complete inhibition of either erythropoiesis, granulopoiesis and thrombopoiesis, or all combined.

In 1910, Selling[1] reported observations on three girls who had been working in a rubber factory and were suffering from benzene poisoning, characterized by "agranulocytosis" and complicated by purpura and hemorrhages. One of them had quit her work long before, illustrating the cumulative and delayed effect of benzene on the hematopoietic tissue. This is a most important point to bear in mind in connection with the coal tar drugs. Later, Selling[2] experimented with benzene as a leukotoxin. He injected benzene subcutaneously into rabbits, and demonstrated the production of leukopenia with little effect on the erythrocytes. Kracke[3] has also shown that benzene may be introduced into rabbits in such small doses that it exerts a selective affinity for the granulopoietic tissue only, leaving the erythrocytes and thrombocytes relatively undisturbed.

Farley,[4] in 1930, reported his review of the literature and cited thirty-nine cases in which the function of the bone marrow was depressed following the use of various preparations of arsphenamine. Since that date, I have found twenty-eight additional cases recorded, making a total of sixty-seven. In these cases the symptoms vary from those of purpura hemorrhagica to those of severe aplastic anemia and malignant neutropenia, depending on whether the principal effect is on the granulopoietic, megakaryopoietic or erythropoietic tissues, or on all of these combined.

The toxicity of organic gold preparations has also been shown. Injections of these preparations will produce a condition closely simulating, if not identical, with primary neutropenia. These cases were reported in France where these drugs are being used quite extensively.[5-11]

Four cases of neutropenia are reported due to dinitrophenol.[12-15] This drug is used to speed up the metabolism and reduce excess weight and was being used for this purpose in these patients. It is interesting to note, in this connection, that as early as 1918, this drug was reported as a dangerous occupational poison.[16]

It is important to observe that the above drugs are capable of producing a type of bone marrow depression restricted chiefly to the granulocytes to such an extent that the clinical syndrome resulting cannot be differentiated from true primary neutropenia.

Since it is known that neutropenia can be produced with arsphenamine preparations, certain organic gold preparations and dinitrophenol which contain the benzene ring, and with benzene itself,

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it immediately becomes evident that many drugs containing the benzene ring will fall under suspicion until they are definitely eliminated either by experimental work or clinical evidence.

It had been observed for some time that cases of neutropenia were occurring principally in physicians, members of physicians families, nurses, patients under physicians care, hospital employees, and that it was confined almost exclusively to the white race and people in well-to-do circumstances. Kracke and Parker[17] conducted a statistical study of several of these groups with particular reference to the usage of drugs containing the benzene ring. They found that three out of four nurses who need an analgesic would select a drug containing the benzene ring and three out of five physicians would use the same drug, whereas only one white layman out of four and one negro out of eight would use these drugs. They, therefore, felt that this disease owed its high incidence in nurses and physicians to their indiscriminate use of drugs of this class.

There are one hundred and seven cases of neutropenia reported in the literature and attributed to the use of drugs other than arsphenamine, gold preparations, dinitrophenol and benzene. The following table gives a list of these cases with the drug suspected.[12, 17-32]

Number of Cases	*Drug Suspected*
13	Amidopyrine or its combinations
63	Amidopyrine
10	Amidopyrine and a barbiturate
1	Amidopyrine plus other drugs
2	Amidopyrine plus allonal
1	Amidopyrine plus empirin
1	Amidopyrine plus phenacetine
1	Amidopyrine, empirin and allonal
1	Coal tar drugs (kind not stated)
2	Phenacetine
1	Acetanilid
11	Barbituric acid derivatives

It can be seen from this table that about one-half of the cases are attributed to amidopyrine alone; about four-fifths of the cases are attributed to amidopyrine plus other drugs, and that ninety-six of the one hundred and seven cases are attributed to drugs containing the benzene ring. All of the patients listed in this table used drugs containing the benzene ring except the eleven who used barbituric acid derivatives. (Barbituric acid is not a benzene derivative.) It is probable, from the evidence at hand, that barbituric acid derivatives alone are not capable of depressing the granulopoietic tissue, so that these cases were probably due to some other cause.

Since amidopyrine heads the list of drugs suspected, a review of the history of this drug may be of interest.

Amidopyrine, prepared by Stolz in 1895, was patented in Germany in 1897 under the proprietary name, "Pyramidon." Pyramidon has been on the American market for at least twenty-five years. Under the pharmacopoeial designation "amidopyrine," the drug has been marketed by American manufacturers for approximately twelve years, i. e., since 1922. During these twelve years amidopyrine has been put on the market in combination with various other drugs. The following tables are interesting in this connection:

Year	*No. of cases reported*
1902-1922	6 (Approx.)
1922-1927	43 "
1927-1931	107 "
1931-1934 (June)	827 "

1922 TO JUNE, 1934

United States	531 (Approx.)
Germany	365 "
France	17 "
England	9 "
Italy	53 "

The prevalence of the disease in Germany and the United States is said to approximate the use of coal tar drugs in these two countries.

From experimental work carried out on drugs of the coal tar series, Kracke and Parker[17] state that there are certain ones, the reactions of which set them apart from other coal tar derivatives, such as aspirin, etc. These particular drugs all have as a nucleus the benzene ring with an attached amino ($-NH_2$) group, making them substituted amines. They have arbitrarily designated these compounds as benzamine drugs. The drugs contained in this group are *amidopyrine, phenacetine, acetanilid, arsphenamine, neoarsphenamine,* and those proprietary preparations which contain one or more of the above-mentioned drugs.

By referring to the graphic formulae of drugs that have been designated as myeloid depressants and to have produced neutropenia, it can be seen that the only thing common to all of these drugs is the benzene ring. It seems, therefore, apparent that it is not the amino group nor any of the other radicles attached to the benzene ring nor the benzene ring itself which makes them myeloid depressants, but more probably it is the way in which they

are oxidized in the body of an individual with an idiosyncrasy to the drug and a hypersensitive bone marrow.

Benzene and the drugs designated as benzamine drugs are oxidized in the body to catechol, hydroquinone, para-quinone, ortho-quinone, and their therapeutic effect is based on one or more of these oxidation products. It is believed that it is one or more of these oxidation products which depress or injure the myeloid tissue. Neutropenia seems only to be produced by these drugs in susceptible individuals. The question arises as to whether they are oxidized differently in susceptible individuals.

Kracke and Parker injected rabbits subcutaneously with benzene and olive oil and eighteen hours later analyzed the tissues from the site of the injections. Benzene was present only in traces, while phenol and catechol (oxidation products of benzene) were present in considerable amounts. Bone marrow from these animals was analyzed and showed the presence of phenol and catechol but no trace of benzene.

Madison and Squier[22b] and Benjamin and Biederman[31] have produced neutropenia four times in three patients who had recovered from an attack of neutropenia thought to be due to benzamine drugs, by administering small doses of amidopyrine. In these patients, symptoms became prominent in from one to three hours after ingesting the drug, chills, rise in temperature, headache, backache and nausea being the most prominent early symptoms. Sore throat, sore gums and prostration appeared later. In the first patient, three hours after taking ten grains of amidopyrine, the total leukocyte count fell to 1,700, with 50 per cent granulocytes; in twenty-four hours the total leukocyte count was 1,000 with 56 per cent granulocytes. In the second patient, twelve hours after taking five grains of amidopyrine, the granulocytes had almost completely disappeared from the blood stream. In the third patient, two hours after taking seven grains of amidopyrine, the total leukocyte count fell from 6,850 to 3,200; in twelve hours it had fallen to 1,200. After this patient's blood picture had been normal for some time, five grains of amidopyrine was given with the same results. Fitz-Hugh[32] gives the report of a patient who had profound neutropenia thought to be due to amidopyrine. A week after hematologic and clinical recovery, the patient was given one five-grain tablet of amidopyrine with an ensuing loss of more than one-third of the circulating neutrophils in three hours. One of the patients in my series of cases who had had three acute attacks of neutropenia and whose blood picture had been normal for two months, took ten grains of sodium amytal compound (contains seven grains of amidopyrine). Chilly sensations and headache were experienced for fourteen hours, followed by severe chills and a temperature of 101° F. The total white cell count, which had previously been normal, fell to 1,475, with 20 per cent granulocytes, thirty-four hours after ingesting the drug. This makes a series of six experiments on five patients in whom neutropenia has been produced with amidopyrine.

Acetylsalicylic acid, alurate (a barbituric acid derivative), and amytal were given to two of the above patients with negative results. These drugs can, therefore, be excluded as myeloid depressants, they having failed to produce neutropenia in known sensitive individuals.

Experimental work on rabbits with these drugs has not been entirely successful, only an occasional rabbit developing leukopenia and neutropenia. This work has been done principally by Madison and Squier,[22] Hoffman and his co-workers,[12] and Kracke and Parker.[17] Failure to produce neutropenia in all rabbits intensively treated with these drugs may be due to the fact that only an occasional animal may have a hypersensitive granulopoietic tissue.

The observation of Selling, that benzene has a delayed and cumulative effect, leads to the speculation that this may explain the increasing number of cases of neutropenia. Madison and Squier reported the history of a patient who had taken amidopyrines for tic douloureux for ten months and then developed neutropenia. Other patients are reported to have used amidopyrine over a period of years before developing neutropenia. It seems possible that some patients may use these drugs over a long period, weakening the granulopoietic tissue from month to month, or year to year, until one more dose, or series of doses, brings on a fulminating attack which may or may not be fatal.

From the material reviewed it seems apparent that the bone marrow and blood changes in many cases of neutropenia are the result of repeated administration of certain drugs containing the benzene ring to which the patient has developed a hypersensitivity. Much more clinical and experimental work

will be necessary to definitely settle this question. It is suggested that further careful studies should be made of all cases of neutropenia with particular reference to a history of the taking of drugs which are in any way likely to be at fault. It must be remembered though, that in taking histories on any one hundred consecutive patients, a history of the use of coal tar drugs could probably be elicited from the majority. We must not be led astray by this history and come to the conclusion that the neutropenia in any given patient has followed the use of these drugs. There are many cases definitely known not to be due to drugs of any kind. Also, many patients use these drugs to excess who never develop neutropenia. If some cases of neutropenia are due to these drugs, and it is certainly evident that some are, then we must assume that the neutropenic syndrome represents the outward manifestation of an idosyncrasy to certain drugs on the part of patients with a primary dysfunction of the bone marrow.

Assuming that certain benzene drugs are an etiologic factor in neutropenia, the question arises as to whether it is necessary to stop their general use, or modify it. Certainly emphasis is to be placed upon the conviction that the use of such potent therapeutic agents should at all times be under the direct supervision of a physician. The indiscriminate and unnecessary administration of these drugs, and the self-administration by the public is certainly dangerous and should be discouraged. Probably the safest course to follow is to use drugs such as acetylsalicylic acid, one of the barbiturates, or codeine, if any of these are just as effective for any particular symptom. If, however, certain of these benzene drugs are found to be unrivaled in their action for a special complaint, they should not be administered for any great length of time as a routine, or in large doses, unless it is possible to make a leukocyte and differential count on the patient at frequent intervals. These precautions are suggested, not because the occurrence of neutropenia is frequent, but because, when it does occur, it is an extremely serious accident.

At this point it might be well to speak of these drugs in connection with other diseases. We frequently see a patient with a severe infection, and a satisfactory leukocyte response, suddenly developing a leukopenia, and we assume that this is the patient's reaction to an over-whelming infection. In such cases the prognosis is grave. It would then seem wise not to administer these drugs, known to be myeloid depressants, to patients with severe infections, as, if they have an idiosyncrasy for these drugs, they will be much more likely to develop leukopenia.

In summarizing the information concerning amidopyrine and the production of neutropenia, we are confronted with the following facts: That neutropenia is more prevalent in the two countries (Germany and the United States) where amidopyrine is used most extensively; that it is more prevalent in the class of people who use this drug most indiscriminately; that neutropenia has increased concomitantly with the increase in the sale of this drug; that it definitely has produced neutropenia in susceptible individuals, and that it has produced neutropenia in an occasional rabbit intensively treated.

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DISCUSSION

DR. HARVEY B. HAAG, Richmond: Dr. Beck's comprehensive and very detailed description of the neutropenia which so frequently apparently follows the use of amidopyrine leaves little of significance for me to add. I do think it is interesting, however, to note the change of attitude that has taken place concerning our opinions regarding acetanilid. I know for many years acetanilid was looked upon as being the most dangerous of this group of coal-tar derivatives. Yet in recent years animal experimentation, as well as clinical findings, indicate that acetanilid is no more dangerous than amidopyrine, or even as dangerous.

Just a word concerning some methods of treatment suggested for neutropenia. Mild doses of X-ray have been suggested, but this procedure has been criticised on the ground that it might produce the very condition it is called upon to treat. Liver extract has been used. Fetal calf liver has been suggested as being particularly beneficial—and, probably, particularly scarce. Repeated blood transfusions have been suggested, especially in those cases associated with severe anemia. Some of the results of transfusions are encouraging; others are not. For several years it has been felt that leukocytes disintegrate somewhere in the system and produce certain substances that stimulate the bone marrow to produce white cells. These substances appear to be derivatives of nucleic acid. So now we find nucleic acids, or, better, neucleotides, being used in attempting to stimulate leucocytic production. Whole leukocytes, also, are being used. Other nucleic-acid substances, particularly guanine are likewise being recommended. Another treatment followed is the use of K-96, a pent-nucleotide which was evolved in Boston, at Harvard. It is prepared from yeast and has a high content of neucleotide. The mortality of those cases treated with this pent-nucleotide is much lower than the percentage treated by any other procedure.

EVIPAL ANESTHESIA.*

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and
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The intravenous administration of an anesthetic is not a recent achievement, but its use has been attended with complications or accidents that have dampened the enthusiasm for this means of producing surgical narcosis. One of the latest, and perhaps the most satisfactory drug that has been used for this purpose is Evipan, or Evipal, as it is known in this country.

Evipal is of German origin, a barbiturate, and chemically known as sodium N-methyl cyclohexenylmethyl barbiturate. It has been thoroughly tested experimentally and chemically abroad, particularly in the country of its origin, and the reports indicate that it has a wide margin of safety. It is reliably reported that three and one-half to four times the anesthetic dose is the lethal dose. Evipal anesthesia has been administered many thousands of times and the reported deaths have been very few. The London (England) Anesthetic Committee of the Research Council gave a most favorable report and stated that only one death in 25,000 administrations came to its notice. This compares favorably with any other anesthetic agent in common use today.

Evipal differs from most of the other barbiturates

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in its prompt elimination. It is said that it is detoxified almost exclusively by the liver and the action is very rapid; for this reason it is not administered in any disease of the liver in which the function of that organ is impaired. Impressed by the reports of investigators abroad, we began its clinical use in December, 1933.

We kept accurate and rather full notes on one hundred consecutive cases in the Gallinger Municipal Hospital and feel that we have acquired a working knowledge of the administration and clinical behavior of Evipal.

It should be stated in advance that while the anesthesia is complete, that is, to the surgical degree, it is of short duration and was used only in those cases, with few exceptions, in which such a type of narcosis was indicated. The following covers the preparation of the patient, the technique of administration and observation of the patient, during and after narcosis:

The preparation of the patient should be the customary one, and in addition ¼ gr. morphine sulphate with or without 1/150 gr. of scopolamine, should be given by hypodermic one-half to three-fourths of an hour before the time set for the operation, assuming we are dealing with the average adult.

Evipal solution is prepared by dissolving 1 gramme of Evipal (a white powder) in 10 c.c. of distilled water, which is drawn up into a 10 c.c. syringe, with a moderately small needle (intravenous type). The dosage is primarily based on the weight of the patient—6 c.c. of the 10 per cent solution for each hundred pounds of weight of the patient, but the maximum dose should not exceed 10 c.c. of the solution. A patient weighing fifty pounds would get 3 c.c., and another weighing 150 would receive 9 c.c., but a 200-pound patient would receive but 10 c.c.

The arm is prepared for the intravenous administration of Evipal and the patient is told to count audibly very slowly, about 60 to the minute. As the patient starts to count, the solution is injected, and this is important—half of the dose is administered in the first 10 seconds, and the remainder within the next half minute. To get the prompt effect, rapid injection is essential because the Evipal is so rapidly broken down and eliminated by the liver, that anesthesia will be very light or unsatisfactory if two or three minutes are used to inject the drug into the circulation. If the patient counts as directed and the solution is rapidly introduced, in about 15 or 20 seconds the counting ceases, the patient yawns, the lower jaw drops, and in approximately a minute from the beginning of the injection the patient is fully anesthetized. Deep anesthesia lasts 10 to 15 minutes. The patient wakes quietly, but completely, in another 15 minutes, but may fall into a light sleep for an hour or two. The entire procedure is remarkably free from excitation, delirium, or mental confusion. Most of the patients state that the sensation was pleasant or that a mere blank existed for the period of unconsciousness.

We will consider the various items of interest concerning our series:

Age.—The youngest was 8, the oldest 74 years, but most were between 20 and 40 years.

Weight.—The lowest weight was 34 pounds, the highest 194½ pounds.

Amount of Anesthetic Used.—The least amount was 2½ c.c., and the greatest was 15 c.c. In the latter case we violated the rule that 10 c.c. was the maximum dose. We gave this carefully and slowly after first 10 c.c., and no alarming symptoms ensued. The patient was a robust young man weighing 179 pounds, requiring reamputation of the leg.

The rule covering the amount of anesthetic to be used, based on the weight, must be modified in certain cases. The feeble or anemic individual, regardless of the weight dose, requires less than the weight would indicate, and one must employ the same judgment as he would in the use of other drugs under similar circumstances.

Duration of Anesthesia.—Most patients were fully anesthetized in 1 minute, and the average duration of the anesthetic state was 12 6/10 minutes. The time required for complete reaction from the beginning of administration of the anesthetic was 25 1/10 minutes. The longest time required was 86 minutes, in a patient with bilateral pulmonary tuberculosis and carcinoma of the breast, and weighed but 86 pounds. This one case is striking evidence that the weight dosage cannot be absolute, but other conditions must be taken into consideration. One patient reacted fully in four minutes, but the anesthesia was sufficient for a very brief operation.

The Pulse.—The pulse rate usually becomes accel-

erated, and in our series averaged an increase of 18.7 per minute. Fourteen of the hundred cases showed a lower pulse rate. There was no outstanding change in the pulse volume in any case.

Blood Pressure.—As may be expected, there was a fall in blood pressure averaging 8.3 mm. Hg. Without exception the pressure returned to the pre-anesthetic reading as the patient became conscious.

Respiration.—The respiratory excursions invariably became slower and deeper, but stertor and cyanosis was never present.

Blood Chemistry.—In a number of the cases the blood chemistry was compared before and at variable periods after operation and they can be briefly summarized:

The CO_2 combining power in sixteen case, from 1 to 20 hours after the use of Evipal, showed an average of 8.9 volumes increase, compared with the pre-anesthetic specimen.

The blood sugar, in twenty-nine cases, showed an average rise of 23.8 mg., in specimens taken 1 to 24 hours post-operatively. Many of these patients had taken a full meal within 24 hours after the operation, and had been fasting for 6 to 12 hours before operation. This probably explains the rise in blood sugar.

The urea-nitrogen, in twenty-one cases, the average change was zero. Those that had a rise (and this was slight) were offset by a fall in others, giving the result as stated.

After estimating the non-protein nitrogen and finding an average rise of 2 mg. per 100 c.c. of blood, these examinations were discontinued because the change was not of sufficient importance to warrant this laboratory work. The white blood count could not be the basis for any sound deduction, as the count was more affected by the operation than any other single element entering into the calculation.

Classification of the Efficiency of the Anesthesia.—We designated the anesthesia on the basis of one plus for those that were not thoroughly relaxed, to four plus for a perfect anesthesia. On this basis we had 11 one plus, 14 two plus, 26 three plus and 49 four plus. We had most of our one and two plus anesthesias in the first forty cases and may be considered the result of our lack of experience, as the later cases were much smoother and better relaxed.

The conditions for which operations were performed will not be detailed, but were mainly of a minor character, such as abscesses, cellulitis, fractures and dislocations, hemorrhoids, et cetera. One Caesarian operation and five appendectomies were the principle major operations.

Thirty-seven of the patients had other conditions or diseases which required consideration from the anesthetist's point of view, but did not modify the operation to a great degree. We will enumerate a few—diabetes, lobar pneumonia, nephritis, hypertension, pulmonary tuberculosis, pyschosis and alcoholism. Notwithstanding this handicap, Evipal was safely and satisfactorily used with distinct advantage to the patient.

It should be stated that in selecting the hundred cases for operation, they were not chosen as good or bad risks, but solely on the ground that they were suitable cases for this particular anesthetic. We had in mind that the operation should require not over 15 or 20 minutes and complete relaxation was necessary. We have continued the use of Evipal in both hospital and office work and exercise the same discrimination in the choice of cases. We have occasionally extended the length of the anesthetic state by increasing the amount of Evipal and giving it in fractional doses, that is, after 15 minutes using an additional 3 c.c. to 5 c.c. of the 10 per cent solution.

SUMMARY

No anesthetic agent can gain wide usage unless its administration is attended with very little risk to the patient. The use of the drug by many anesthetists, with a wide variety of cases, will be the gauge by which it is measured.

Evipal appears to have many properties which recommend it for its general use, such as the simple and inexpensive equipment in its administration, the freedom from nausea and excitation, the prompt reaction, and safety.

One should bear in mind the limitations and particular indications of any anesthetic and to confine its field until experience allows the field to be widened, contracted, or entirely eliminated.

Evipal should be used in those cases in which a brief and full anesthesia is required, if Evipal is to be used alone. It is possible that it has a place as a preliminary anesthetic and it is possible that

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its length of narcosis may be extended by fractional and larger doses. And one thing more—its administration should be entrusted to some one, preferably an anesthetist, whose sole responsibility will be the anesthesia.

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SURGICAL TREATMENT OF RETINAL DETACHMENT WITH ELECTRO-COAGULATION.*

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This condition has been known from its clinical and ophthalmoscopic manifestations for many years but up until the work of Gonin practically no advancement in its treatment had been made. Gonin came to the conclusion that the tear in the retina is the cause of the detachment and that by closing the tear the retina becomes reattached, thereby curing the detachment. Gonin uses the actual cautery to produce a sealing of the tear.

Other methods were evolved, Guist, of Vienna, making multiple trephine openings in the sclera, exposing the choroid which he then cauterized with potassium hydroxide, then perforating the choroid in one or more places to evacuate the subretinal fluid.

Lindner modified the method of Guist in reducing the number of trephine openings by starting from a single or from a few trephine areas, to undermine and lift up the choroid covering the rent from the sclera and then injecting diluted potassium hydroxide between the sclera and the choroid.

Larsson originated the use of ball electrode for its scleral effect in the treatment of detached retina. Larsson applies the small ball electrode to the sclera; after cauterizing a sufficient area of the sclera he trephines the sclera and perforates the choroid to let out the sub-retinal fluid.

Weve supported the work of Larsson but added in some cases the use of a fine straight diathermy needle with which he made multiple punctures into the sclera for a third of its depth; if necessary, he made a further puncture with a larger diathermy needle to let out the sub-retinal fluid.

Walker has recently published an excellent article dealing with the treatment of detachment by the use of his own diathermy instrument and electrodes.

I have not seen Walker's instrument used but his electrodes are particularly ingenious. The electrodes are made of iridium-hardened platinum and can be sterilized and cleaned by heating to redness in the Bunsen flame. The electrodes are not insulated so that a mild scleral or Larsson effect is obtained. All of the electrodes are so made that they may be threaded to prevent loss in the tissues.

SAFAR'S OPERATION

Safar evolved the best electrodes for the treatment of detached retina. There are several types—the brush-like electrodes consist of an insulated handle and of a plate also insulated in which a number of fine bright needles, usually six, are fastened, protruding to the length of 1.5 to 2 mm. The comb- or rake-like electrodes are miniature rakes without handles, having two to three projecting needle-like points 1.8 mm. in length. The nail- or spike-like electrodes without handles have a single needle-like electrode. When inserted into the sclera the needle or needles perforate easily with the current turned on, and remain fixed in the sclera after the current is turned off. The comb-like and the spike-like electrodes are used anteriorly while the brush is usually used posteriorly.

By the Safar method the self-retaining needle perforates the sclera and choroid only. The needles plug the openings so that the sub-retinal fluid cannot escape until the needles are removed. In the use of an ordinary needle electrode in making perforations of the sclera, its removal permits the sub-retinal fluid to escape and the retina to come in contact with the choroid, so that, when the needle is reinserted, there is danger of injuring the retina. When sufficient perforations have been made over the area of the detachment, the self-retaining needles are removed and the sub-retinal fluid will be seen

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to come through these small openings; if it does not, a larger needle can be inserted through the sclera to obtain drainage.

The use of the spike-, comb- or rake-like needles by the Safar method prevents the premature softening of the eyeball by preventing the loss of the sub-retinal fluid. The loss of the sub-retinal fluid during the operation makes it more difficult to keep a dry field. Large openings in the sclera, such as made by a trephine or cautery, tend to produce a hernia of the retina through the large opening in the sclera and choroid. This hernia, becoming fixed in the opening, may cause further detachment later.

OBSERVATION OF DIATHERMY TREATMENT OF RETINAL DETACHMENTS IN SOME OF THE EUROPEAN CLINICS

In Dr. Foster Moore's clinic in the Royal London Ophthalmic Hospital (Moorefield's), we observed a case of detachment operated upon by the diathermy method. About twenty appplications of the ball type electrode were made over the area of detachment. The sclera was then trephined over the area of the tear and a punctum dilator was used to perforate the choroid. Advise that the patient be kept in bed for three weeks.

In Oslo we attended the clinic of Prof. Hagan, who operated upon a case of detachment near the macula. There were three holes in the retina. After exposing the globe, he cut the external rectus muscle and got back to the insertion of the inferior oblique and then applied the ball type electrode. After each application the retina was observed with an ophthalmoscope. This was repeated in four places, after which the sclera was punctured with the actual cautery in the region of the holes.

In Stockholm we observed Larsson operate upon a detached retina. He, of course, uses his own method with ball electrode, and does a canthotomy to get a better exposure of the globe.

In Prof. Lauber's clinic in Warsaw we observed an operation for detachment, using the three-point comb- or rake-like applicator of Safar. He uses opaque goggles before and after the operation for detachment.

At the University Clinic, in Berlin, Kruchmann used a straight needle electrode in operating for detachment. His assistant observed the fundus after each perforation with the needle. He does not pay any particular attention to the location of the tear.

Meller, of Vienna, operated upon two cases of detachment, using the needle and the ball electrodes. He used the needle to make two lines of punctures, one line 21 mm. from the limbus, the other 16 mm. from the limbus, and then applied the ball electrode between the lines. The sub-retinal fluid escaped from the openings made by the needle electrode. Meller also uses the opaque goggles with the central perforation. He keeps the patient in bed for five weeks. In the second case he made two lines of punctures, one 15 mm., the other 21 mm. from the limbus, again using the ball electrode between the lines.

Lindner, of Vienna, operated upon a case of detachment in a high myope, who had previously had two unsuccessful operations for the detachment. Believing that the eyeball was too long to get reattachment of the retina, he removed a strip of sclera 4 by 20 mm. After thorough union has taken place, he intends to again operate for the detachment.

We observed Magitot, of Paris, operate upon a detached reina by the use of the actual cautery. He burned the sclera in four areas about the detachment, and then perforated through the center of these applications with the actual cautery, going through the sclera and choroid.

IMPORTANT LANDMARKS

Remember that the ora serrata is 8 mm. posterior to the limbus, and no application should be made in this area between the ora serrata and the limbus. Avoid the venae vorticosae.

The macula is 28 mm. posterior to the limbus, and should be avoided. When there is a detachment at the macula, make the applications in the form of a horseshoe, with the open end of the horseshoe towards the optic nerve, being careful not to make any applications to the macula.

OPERATIVE TECHNIQUE

Rest in bed for several days to two or three weeks is advised, having the patient wear (Lochbrille-Hole spectacles) opaque glasses with central transparent area about 4 mm. in diameter. In detachments involving the macula it is advisable to operate as early as possible.

Sodium amytal, gr. iii, is given the night before the operation and repeated again the next day two

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hours before the operation. Codein sulphate is given hypodermically one-half hour before the operation.

The eye and surrounding tissues should be thoroughly cleansed. Akinesia is obtained by O'Brien's method.

Local anesthesia is obtained by repeated instillations of 4 per cent solution of cocain or 2 per cent solution of butyn and adrenalin, followed by a retrobulbar injection of 1 per cent novocain. External canthotomy is advantageous in most cases.

The conjunctiva and Tenon's capsule are now incised well back from the limbus, and the sclera is freely exposed and dried over the area of the detachment.

Often one, but at the most two, of the recti muscles must be resected, although it is possible in some cases to lift the muscle away from the globe by the use of ligatures.

The so-called nail- or spike-electrodes, as well as the rake- or comb-electrodes, have no handle and it is necessary for the operator to wear rubber gloves and grasp the electrode with a pair of forceps and apply the ball electrode to the forceps which carries the current to the electrode. Care must be used to prevent burning of the surrounding tissues, and it is advisable to have insulated retractors.

With the proper amount of current the electrode readily perforates the sclera; the current is then turned off and the forceps removed, leaving the electrode in the sclera, which prevents the premature escape of the sub-retinal fluid. A sufficient number of electrodes are inserted into the sclera to surround the rent, and then another series of electrodes are introduced to act as a barrage of blocking adhesions, care being taken to limit the applications to the region of the detachment.

If the detachment extends far back towards the posterior pole, the small electrodes are difficult to use, in which case the brush-like electrode containing six needles is very easily applied, the only disadvantage being the loss of sub-retinal fluid after removing the electrode. For this reason, use the brush electrode after inserting the required number of smaller self-retaining electrodes.

After completing the diathermy treatment, the small needles are all removed, which permits the sub-retinal fluid to escape; if the fluid does not appear, use a larger and somewhat longer needle electrode, going through the sclera and choroid, which will then give free drainage of the sub-retinal fluid.

Tenon's capsule, conjunctiva, muscles and the external canthotomy wound are sutured. Atropine is instilled into the operated eye and an occluding dressing for both eyes is used to put the eye at complete rest.

Patient's position in bed is such that the area of former detachment lies as low as possible. In detachments located above, elevate the foot of the bed; if below, put patient in a half-sitting position in bed; if on the left or right, have the patient lie on the side that will cause the area of the detachment to be as dependent as possible.

The first change of dressing is made on the fourth or fifth day, and then only to make external inspection and careful cleansing of the eyelids (prohibit all movement of eye during the dressing). Instill atropine and again apply occluding dressing to both eyes. Renew dressings every five days. Remove dressing at end of third week and give hole-spectacles which are to be worn for three to four weeks.

Do not remove sutures early; wait ten to fourteen days, and have the eye well anesthetized on account of the danger of a sudden movement of the eye.

Complete healing of the fundus with firm union of choroid to retina takes place in six to eight weeks.

CASE REPORTS

Case 1.—Mrs. O. W. E., white, age 56, occupation housewife, referred by Dr. Mitchell, of Lexington, Va. Seen first on August 7, 1933, complaining that on June 26, 1933, she felt a little prick in the right eye, and since then seems as though there is a mist over the right eye. Has had poor vision in the left eye all her life. Examination revealed the following:

Vision: Right eye—patient could see light, but could not count fingers at one foot; left eye shows good light projection.

Ophthalmoscopic Examination: Right eye—vitreous filled with thick opacities and with the ordinary ophthalmoscope could not make out any fundus details, but with the giant Gullstrand ophthalmoscope could make out a detachment below. Left eye showed stretching of choroid and many atrophic areas.

Patient has about fifteen diopters of myopia in each eye. Pupils react to light, accommodation and

consensually. Fields of vision—in the right eye it was impossible to obtain any field even with a large object; the left eye was normal for form and color.

Corneal microscope shows in the right eye increased flare in the anterior chamber and some old blood vessels in the periphery of the cornea.

Rest in bed was prescribed and opaque lenses with 4 mm. opening in the center and shields to the side should be worn constantly. Patient kept at home until August 17th and then entered hospital. Patient was put to bed and continued to wear the hole spectacles. Right eye showed considerable clearing of the vitreous; disc and blood vessels could be made out and a large detachment, which extended from the lower border of the external rectus to the nasal border of the inferior rectus, was readily made out. Could not locate any tears.

Operation August 18, 1933, under local anesthetic. Canthotomy done externally. Conjunctiva was incised about 10 mm. from limbus and the eyeball well exposed; inferior rectus was severed and eye rotated upward; sclera was then thoroughly dried. With the Sanitax ophthalmotherm eight single Safar needles were inserted into the sclera anteriorly, while the Safar brush with six needles was applied in two areas posteriorly. In removing the brush electrode, sub-retinal fluid came through the openings; also when the Safar self-retaining single needles were removed, sub-retinal fluid oozed through the openings. The inferior rectus, conjunctiva and the canthotomy incision were sutured. Atropine instilled in operated eye and both eyes were bandaged for three weeks, patient remaining in the hospital for one month.

September 27, 1933, right eye showed many vitreous opacities; could make out the disc with a -18.00 sphere; no signs of detachment. After removal of the bandage patient continued to wear the glasses with a small central opening.

November 25, 1933, vitreous opacities much thinner; retina reattached. Fundus shows atrophic areas where the diathermy electrodes were applied. Fields of vision for form and color normal. Vision—right eye—with a -15.00 sphere = 3/200.

January 27, 1934, vision in right eye with a -15.00 sphere = 7/200. Tension normal. Vitreous opacities much thinner and no signs of detachment anywhere in the fundus.

Case 2.—Miss M. L. L., white, age 65, first seen March 28, 1933, at which time she showed hypermature complicated cataract of the right eye. Left eye showed senile lens changes, particularly nasally, large vitreous opacities, and stretching of the nerve-head with several areas of choroidal atrophy.

Vision—right eye—shows poor light projection, being accurate from the right side only. Vision of left eye with -16.00 sphere = 11/120, although patient reads No. 62 M-type with a -6.00 sphere.

Pupillary reactions—right eye—no reaction; left eye normal. Tension normal in each eye. Contact lens placed over the left eye and a -18.00 sphere added gives patient vision of 6/60.

Cataract progressed rather rapidly, and on October 10, 1933, combined extraction was made under local anesthetic. January 9, 1934, Ziegler V-shaped capsulotomy was made under local anesthetic. March 1, 1934, vision—left eye—without glasses = 6/45, and with the reading glass read No. 62 M-type best at 10 cm. March 3, 1934, patient came in complaining that on March 2nd she noticed something coming over the left eye. Examination showed detachment of the retina below and temporally.

Prescribed perforated opaque lenses to be worn and patient to remain in bed.

March 16, 1934, detachment had increased, and in looking into the fundus a large balloon-like detachment was seen temporally extending from one o'clock to six o'clock. Anterior portion of the detachment best seen with a +13 sphere. Few vitreous opacities seen but no tear could be made out. With the patient looking straight forward the detachment covered three-fourths of the disc, only a small portion of the nasal part of the disc being seen.

Operation for detachment under local anesthetic March 17, 1934. Local anesthetic was used. Akinesia by O'Brien's method was followed by retrobulbar injection of novocain. External canthotomy was done.

Conjunctiva and Tenon's capsule were incised about 10 mm. from limbus, and sclera and external rectus exposed. Suture passed through external rectus and tendon severed 2 mm. from attachment. Suture passed through stump of external rectus attachment to rotate the globe nasally.

Sclera was dried and four nail- or spike-like electrodes inserted, back of which two comb- or rake-

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like electrodes with three needles were inserted; then a six-point brush-like electrode was inserted, first above and then below region of macula. Applied the ball-like electrode to the sclera (Larsson's method) in four areas not touched by the needle electrodes.

Sub-retinal fluid escaped from all the openings, the globe becoming flattened and quite soft. External rectus sutured to its original attachment. Tenon's capsule and conjunctiva were sutured and the external canthotomy wound was sutured.

Eye was cleansed, atropin instilled, and binocular occlusion dressing applied.

Patient returned to bed and ordered to lie on left side to obtain the benefit of gravity in getting the retina in contact with the choroid.

Patient was discharged from the hospital April 6, 1934, and kept in bed at home, using the perforated opaque lenses. Patient permitted to get out of bed April 26, 1934, but still wore perforated spectacles.

Examination April 28th showed retina firmly reattached and a moderate number of vitreous opacities. Vision was 10/200 for distance and patient read No. 1.00 M-type. Field of vision fairly full for form and color to the left, but still has loss of visual field to the right.

CONCLUSIONS

Electro-coagulation following the technique of Safar is probably the safest and most dependable method for the treatment of retinal detachments.

The Safar electrodes prevent damage to the retina and the vitreous. Hemorrhages rarely, if ever, occur.

The operation can be successfully performed even if no tear can be made out.

The Safar method can be combined with any of the other methods mentioned, but preferably with the ball electrode procedure of Larsson.

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RECURRENT RHEUMATIC FEVER WITH PERICARDITIS TERMINATING IN SEPTICEMIA.

Report of a Case with Necropsy and Experimental Bacteriological Studies.*

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The etiology of rheumatic fever has not been settled, but it is becoming increasingly evident that it is a bacterial and probably a streptococcal infection. The tendency toward the development of inflammatory lesions of endothelial and subendothelial tissues, the rarity with which parenchymatous tissues are primarily involved, the not infrequent relationship to preceding infections of the upper respiratory tract, the frequent occurrence of carditis and the chronicity with acute exacerbations point to its being a systemic infection. In view of the unsettled state of knowledge regarding etiology and in spite of many common characteristics, cases are seen which resemble rheumatic fever but which it is impossible to positively diagnose as such. The outstanding clinical features are the migratory febrile arthritis without residual joint disability and the frequent occurrence of acute and chronic pericarditis, acute myocarditis and chronic endocarditis. Pathologically, the only distinctive lesion is the Aschoff body, which in chronic cases is usually not found. The case here reported had many of the clinical features of rheumatic fever with migratory

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arthritis and acute pericarditis. It terminated in a frank streptococcal septicemia, but a thorough necropsy did not reveal a focus of infection. The question arises as to the relationship of the terminal septicemia to the apparent rheumatic infection. It is possible that both phases of the case were due to the same cause, but this is not susceptible of proof.

Although it is impractical, if not impossible, to completely search the literature for records of cases similar to the one we are reporting, an extensive search has been made of the literature on the subject of rheumatic fever appearing in the past few years, and no exactly similar case has been discovered. We consider this case to be sufficiently interesting to warrant publication.

REPORT OF CASE

Clinical Record.—The patient, a colored woman, was first admitted to the Georgetown University Hospital on September 16, 1931, at which time she was twenty-four years old. For three weeks she had had painful swellings of some of her joints, definitely migratory and closely resembling rheumatic fever. First the right hip, then the left ankle and finally the right ankle had been involved. There had been pain also in the right flank and the lower abdomen at the onset. Fever and headache had occurred during the illness. She stated that she had had a similar affection of the right wrist six months previously and that "sore throat" had been present twice a year for the preceding two years. Leukorrhea had been present for ten years, associated with menstruation, but there was no suggestion of a gonorrheal infection. On admission the right ankle only was involved. It was moderately swollen, hot and tender. The tonsils were definitely chronically infected. The breasts were distended with milk, since she was still nursing her third baby, which was one year old. Otherwise the physical examination was negative. The temperature was 101.6° F., the pulse rate 100 and the respiratory 32 per minute. The urinalysis was normal except for a few leukocytes. The hemoglobin was 74 per cent (Dare method), the erythrocytes numbered 3,650,000 and the leukocytes 6,200 per cu. mm. of blood, with 80 per cent polymorphonuclear neutrophiles. The blood Wassermann and Kahn tests were negative. Within two weeks the temperature returned to normal and the ankle ceased to be affected. Tonsillectomy was performed during the fourth week, and the patient left the hospital apparently entirely well.

She returned to the hospital eight months after her first admission, May 28, 1932. Three weeks before she had had "indigestion" with vomiting and malaise. A few days before admission she had begun to have severe pain along the left border of the sternum, aggravated by deep breathing and associated with a paroxysmal, unproductive cough. She was unable to sleep lying on her back, but could do so lying on her side. On admission the temperature was 103.6° F., the pulse rate was 130 and the respiratory rate was 22 per minute. The area of cardiac dulness was greatly increased both to the left and to the right, there was a pleuropericardial friction rub under the lower half of the sternum and in the third and fourth intercostal spaces to the left of the sternum, and a faint apical systolic murmur was heard. Otherwise the physical examination was essentially negative. The urine contained albumen, graded 3, and some hyaline casts and leukocytes. The hemoglobin was 44 per cent (Dare method), the erythrocytes numbered 2,770,000 and the leukocytes 3,500 per cu. mm. of blood, with 63 per cent polymorphonuclear neutrophiles. Fluoroscopic examination of the chest showed a greatly enlarged cardiac shadow with very slight pulsation, indicative of massive pericardial effusion. A roentgenogram showed the transverse diameter of the cardiac shadow to be 21 cm. and the transverse diameter of the thorax to be 26 cm. During the first two weeks of hospitalization the temperature remained continuously elevated, ranging from 101° F. to 103° F., with a slight tendency to decline. The pulse rate ranged between 100 and 130 per minute. In the beginning of the third week the temperature rapidly declined and remained normal during most of that week and during the fourth week, at the end of which she was discharged. By the end of the second week the friction rub had disappeared. The area of cardiac dulness rapidly decreased after this time, and in the middle of the third week a roentgenogram showed the transverse diameter of the heart to be 14.2 cm. The pulse rate remained about 80 per minute during the fourth week. Two blood transfusions were given. At the end of the third week the hemoglobin was 54 per cent, the erythrocytes numbered 3,760,000 and the

leukocytes 6,000 per cu. mm. of blood, with 75 per cent polymorphonuclear neutrophiles. The patient left the hospital apparently completely recovered. There was still a very faint apical systolic murmur.

She was last admitted to the hospital on September 2, 1932. She had been seen in the cardiac clinic in July, at which time she was weak, had a persistently rapid pulse, with a temperature of 99.4° F., and was dyspneic on exertion; the cardiac examination was negative. During the few days preceding admission she had been feeling badly, was more dyspneic and had palpitation. The left knee, left elbow and right wrist had become swollen, hot and painful. The temperature on admission was 101.5° F., the pulse rate 130, and the respiratory rate 32 per minute. Except for the joints alluded to and some enlargement of the area of cardiac dulness the physical examination was essentially negative. The urine contained albumen, graded 3, and hyaline casts, graded 3. The hemoglobin was 40 per cent (Dare method), the erythrocytes numbered 3,010,000 per 100 cu. mm. of blood, and the leukocytes numbered 4,350, with 63 per cent polymorphonuclear neutrophiles. With rest and the use of sodium salicylate the joint manifestations disappeared in one week. The temperature had reached normal by the sixth day, the highest having been 103° F. The pulse rate did not drop correspondingly but remained about 110 per minute. She continued to feel weak. During the second, third and fourth weeks the temperature tended to remain near the normal level with occasional elevations to from 100° F. to 102° F. The average pulse rate was about 100 per minute. She complained for a few days of pain in the right chest anteriorly and later of pain in the left ear, both of which completely subsided after a time. A fluoroscopic examination of the chest showed some increase in the heart shadow to the right and a little increase to the left. During the fifth and sixth weeks the temperature was elevated daily, being about 99° F. in the morning and from 101° F. to 102° F. in the afternoon. The pulse rate varied from 100 to 120 per minute. The respiratory rate was never greatly increased. About the middle of the sixth week she began to complain of pain in the left shoulder and both elbows, which disappeared after a week under salicylate administration. The albuminuria persisted, and pus and bacteria appeared in the urine.

The first five days of the seventh week passed with the temperature never rising above 100° F. On the morning of the sixth day of that week the temperature rose to 103.5° F., and that evening it was 104.6° F., with the pulse rate 140 and the respiratory rate 22 per minute. The blood pressure, previously about 100 systolic and 78 diastolic, was 90 systolic and 58 diastolic. The posterior cervical and axillary lymph nodes were slightly enlarged and tender. The spleen was just palpable. The lungs were clear and the heart unchanged. A few splintered petechiae were appearing on the hands, mainly about the hypothenar eminences. The following day these petechiae were more numerous and larger, and the gums were bleeding. The spleen was quite tender. The patient complained of some pain substernally. The temperature was 98.° F. in the morning and rose to 103.8° F. in the afternoon, the pulse rate remaining very rapid. Next day the temperature did not rise in the afternoon over 101° F.; there was a nose-bleed, and extreme tenderness in both splenic and liver regions was elicited. After this the temperature was septic for four days, rising as high as 105.2° F., at the end of which time the patient died. On one of these day she had two chills, and the left wrist became swollen and painful; the petechiae on the hands increased and appeared also in the mouth. The hemoglobin was 53 per cent (Newcomer method), the erythrocytes numbered 2,810,000 and the leukocytes 11,550 per cu. mm. of blood, with 96 per cent polymorphonuclear neutrophiles. The blood non-protein nitrogen was 45 mgm. per 100 c.c. of blood. A blood culture taken at the end of the second week in the hospital revealed growths of diphtheroids after three weeks, but little significance was attached to this result. At the beginning of the last week blood culture revealed a flourishing growth of green-producing hemolytic (alpha prime) streptococci in two days, and cultures repeated the following day and on the day of death showed the same organism. During the final phase of her illness salicylates had no effect upon the arthritic or other manifestations.

Necropsy.—Only essential features will be given. The heart measured 14 cm. in its tranverse diameter; it extended 6 cm. to the right of the midline. Delicate fibrous adhesions were present between the retrosternal tissues and the epicardium and between the pleurae and the epicardium. The epicardium

and the pericardium were adherent throughout most of their extent by similar adhesions, between which there was a small amount of gelatinous fluid. Several petechiae were present on the posterior surface of the epicardium, and the epicardial fat was very edematous. The myocardium was friable and yellowish brown. The endocardium, valves, great vessels and coronary arteries appeared quite normal. The heart weighed 350 grams (normal 275 grams). The lungs appeared normal except for congestion in the bases. The pleurae were normal except for the adhesions to the epicardium, and there was no fluid in the pleural cavities. The liver weighed 1,200 grams (normal 1,200 grams) and showed evidence of congestion. The spleen weighed 275 grams (normal 150 grams) and was soft. There were adhesions between the spleen and the diaphragm. On section of the spleen the Malpighian corpuscles were seen to be prominent, and the pulp was mushy. Covering the intestines and settling in the most dependent parts of the peritoneal cavity and pelvis was a small amount of yellowish white, liquid pus, estimated to be between 200 and 300 c.c. The stomach and intestines appeared entirely normal; there was no congestion nor roughness of their serous covering. Fibrin was not in evidence. The pelvic organs were very carefully examined and appeared to be entirely free of evidence of recent inflammation. There were a few old adhesions between the ovaries and the fimbriae of the tubes, and the ovaries contained a few small hemorrhagic cysts. The other abdominal viscera were apparently normal.

Microscopic examination revealed the following: The epicardium was thickened, edematous and invaded by moderately vascular, fibrosing granulation tissue with elongated foci of polymorphonuclear leukocytic and lymphocytic infiltration. There was some infiltration also extending from the epicardium a short distance into the subjacent myocardium, but, except for some acute toxic degenerative changes and a little interstitial edema, the myocardium was otherwise normal. Aschoff bodies or other inflammatory changes were entirely lacking. The lungs were essentially negative except for some congestion. The liver showed acute congestion. There was acute splenitis with small infarcts. The kidneys were essentially normal.

Cultures of the heart blood and of the pericardial fluid showed alpha prime streptococci similar to those obtained in cultures of the blood made during the patient's life.

Experimental Bacteriological Studies.—The results of these studies, conducted at the National Institute of Health, Washington, D. C., were reported in greater detail by Hedley and Rose in *Public Health Reports*, Vol. 48, No. 34, August 25, 1933, page 1038. Three monkeys were injected intravenously with fresh cultures of alpha prime streptococci from the patient. Two developed arthritis and one died of toxemia. No evidence of heart disease was found. One monkey intravenously injected with an extract of cardiac tissue developed an acute bacterial endocarditis. Thirteen rabbits were similarly injected with streptococci from the original or subsequent experimental cases. Four developed muco-purulent arthritis and two developed myocarditis. Twenty-six rabbits were injected with extracts of heart muscle from the patient or from rabbits with endocarditis. Fifteen developed acute bacterial ulcero-vegetative endocarditis of the right side of the heart. The heart of one of these rabbits is shown in Figure 1. Three developed muco-purulent arthritis. None of the lesions produced in this work, however, are considered to be evidence that the organism isolated from the patient was the organism responsible for her polyarthritis or pericarditis. Such lesions are seen as a result of almost any severe streptococcal bacteremia in monkeys and rabbits.

Fig. 1.—Heart of rabbit showing massive vegetations in right auricle and ventricle.

DISCUSSION

The foregoing case reminds one of a statement about rheumatic fever from an unknown source: "We do not know when it starts, we often cannot recognize it when it is here, we have no cure for it, and we cannot tell when it is gone." The disease apparently commenced as a simple case of migrating polyarthritis. Later, pericarditis developed. Apparently the progress of this condition was arrested. The patient became fever-free and the acute phase subsided, leaving as a residue some intrapericardial and mediastino-pericardial adhesions. During the interim between this attack and the last admission the patient was somewhat dyspneic and had a slight elevation of temperature, conditions frequently seen in the course of active rheumatic carditis. At the beginning of the last admission the picture appeared to be that of a recrudescence of the rheumatic state. The response to salicylates was confirmatory of this impression. Later, the picture changed from that of rheumatism to that of a severe septicemia. The lack of response to salicylates, the petechiae, the high leukocyte count, the febrile course, and the persistently positive blood cultures are sufficient proof of this.

Just when the rheumatic element merged into or was superseded by the bacteremic cannot be said. Whether the alpha prime streptococcus obtained in the last phase of the disease was the primary etiologic factor cannot be determined, the agent responsible for rheumatism not being known. The experimental work, while of academic interest due to the constancy with which lesions of the tricuspid valve were produced, actually shed no light as to the possibility of the isolated organisms being the etiologic factor in the production of the rheumatic state. These inconclusive results are in accordance with those of other workers and by no means entirely discredit such a possibility.

The relationship to rheumatic fever of streptococci in the general circulation or infected tissues is still a moot question. Many of the earlier workers occasionally obtained streptococci on blood culture or on culture of joint fluids. These were hailed as possible etiologic agents. In no instances have these claims been substantiated.

More recently, with improvement in technic, various workers have been more successful in obtaining growths of streptococci from the blood streams of active cases of rheumatic fever patients. Cecil and his co-workers[1] obtained positive blood cultures in thirty-five of sixty cases (58.3 per cent). Of these, thirty-three were alpha, one beta, and one gamma types of streptococci. These organisms fell into distinct immunological groups, but none was advanced as the etiological factor. Clawson[2] obtained positive cultures, mostly viridans, in fifty of 100 cases. He does not regard the organisms as biologically related; he believes that while there is a direct invasion of the tissues there is also an allergic factor, as a result of which tissues over-react. Gray, Fendrick and Cowen[3] in a series of twenty-eight rheumatic fever patients obtained positive blood cultures in twenty cases (71 per cent). The organisms were of the alpha type in sixteen instances. Small[4, 5] and Kreidler[6] isolated a gamma type of organisms, which was called the streptococcus cardio-arthritidis, from the blood of three of 116 rheumatic fever patients and from the throats not infrequently. The organism was described as having constant cultural and biological characteristics and was described as the etiological factor. Subsequent work has failed to confirm this belief. The organism described by these workers appears to be a common inhabitant of the normal flora of the alimentary tract.[7]

Other workers, including Kinsella and Swift,[8] Nye and Seegal,[9] Irvine-Jones,[10] Jordan,[11] and Lynch[12] have been unable to obtain high percentages of positive blood cultures in rheumatic fever. Furthermore, it cannot be shown that the organisms obtained by the more successful workers are not adventitious invaders, or, in some instances, terminal invaders. Practically every organism advanced as an etiological factor has its counterpart in the normal flora of the gastrointestinal or respiratory tract. Grant and Lewis[13] believe that streptococci not infrequently invade the blood stream of healthy as well as diseased individuals.

Attention is directed to the infrequent occurrence of rheumatic pericarditis without myocarditis or endocarditis (Sprague, Burch and White[14]). The cause of the purulent peritoneal exudate in this case is indeterminate. There was no evidence of peritonitis. The picture was not that of rheumatic peritonitis in which definite peritoneal inflammation, frequently with Aschoff-like bodies in the

peritoneum, is usually present (Rhea,[15] Wood and Eliason[16]).

SUMMARY

An unusual case is reported of a young colored woman who for a year and a half had recurrent attacks of rheumatic fever alleviated by salicylate therapy and in one of which she had pericarditis with effusion. During one of these attacks of polyarthritis she suddenly developed manifestations of septicemia which did not respond to the administration of salicylates. Blood cultures showed flourishing growths of alpha prime streptococci. At necropsy, besides the visceral manifestations of septicemia, there was evidence of healed pericarditis and a purulent peritoneal effusion of unexplained origin. Myocarditis and endocarditis were not present. Experimental bacteriological studies with monkeys and rabbits showed the organism isolated from this patient's blood to be extremely virulent and to produce in many of the animals arthritis and ulcero-vegetative endocarditis. The question naturally arises but cannot be settled as to the relationship between the etiological factor of the recurrent attacks of rheumatic fever and the streptococcus isolated in the terminal septicemia.

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APPENDICITIS VS. ITS COMPLICATIONS.*

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In 1827 Dr. F. Mêlier described appendicitis, and named among its symptoms fixed pain in the right iliac fossae and colic. This brilliant and original young Frenchman was years ahead of his contemporaries. He reported cases of undoubted appendicitis, verified by autopsy; described gangrene, perforation, associated peritonitis, and appendiceal concretions. He said, "If it were possible to establish with certainty the diagnosis of this affection, we

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could see the possibility of curing the patient by operation. We shall perhaps some day arrive at this result."

In spite of his discoveries and demonstrations, the profession for the next fifty years followed the teaching of DuPuytren, that abscesses in the iliac fossae originate from the cecum and not from the appendix. In 1886, Dr. Reginald Fitz, of Boston, persuaded the medical world that these abscesses came from the appendix, and originated the term—appendicitis. Consequently, for the past forty-seven years the profession has been dealing with this disease and its complications with a full knowledge of their nature and origin, and it will be the purpose of this paper to indicate the measure of success and failure attending these efforts.

The United States of America and Canada possess the unenviable distinction of having the highest mortality rate from appendicitis of any other civilized countries. The Metropolitan Life Insurance Company, after an analysis of 34,408 deaths from appendicitis among its policy-holders, found that appendicitis ranked second only to cancer among surgical diseases. From all parts of the country a warning is being broadcast that the death rate from appendicitis is steadily increasing. Regardless of the cause or causes of this increase, if there be an increase, it certainly cannot be attributed to any lack of interest or neglect of this subject, from an academic standpoint at least, by the medical profession; for, between the years of 1916 and 1930, inclusive, 2,103 papers on this subject appeared in the world literature, 1,050 of them dealing with acute appendicitis. The testimony of all papers on this subject and of all individual surgical experience is to the effect, that the complications of appendicitis, and not appendicitis itself, are the cause of almost all of this mortality.

Dr. Frank Boland, in a survey of 4,270 cases of appendiceal diseases treated in eight hospitals in Atlanta by 197 surgeons, with a mortality rate of 4.4 per cent, observes that an analysis of these deaths shows that only .4 of 1 per cent died of appendicitis, and that 4 per cent died of the associated complications.

Dr. John O. Bower, of Philadelphia, made a somewhat similar survey in that city, reporting 6,123 cases treated in twenty-seven hospitals by 364 surgeons, with a mortality rate of 7.3 per cent, with practically the same findings.

These surveys have shown little that was not well known before, but serve the useful purpose of being concrete examples, in a large way, of results accomplished by groups of surgeons in our medical centers, and of emphasizing the fact that a mass of people are dying needless deaths. For instance, these surveys show conclusively that if all cases of appendicitis were operated on early, that is, within six or twelve hours after the onset, there would be practically no mortality from this disease. However, it is not safe always to wait even twelve hours, for not a few cases were encountered where widespread peritonitis had developed within this limit, and some within as short a time as six hours after the onset of pain. These fulminating cases had almost invariably been purged. Yet it is easy to visualize the same results being achieved by a virulent infection without the aid of purgation.

Specifically, Dr. Bowers' survey showed that patients operated on within twelve hours are 99 per cent safe; if operated on within twenty-four hours, one in thirty-nine dies; if operated on within forty-eight hours, one in seventeen dies; if within seventy-two hours, one in thirteen dies, and if over seventy-two hours have elapsed, one in nine dies. It also showed that in 44.7 per cent of all cases admitted, some form of peritonitis had developed. The irony of this last fact is that it took place in Philadelphia, the site of the first Medical School in America, and in a city that prides itself on being the medical center of the United States.

The writer has drawn freely from these surveys because they illustrate most forcibly the vital importance of the time element. After all is said and done, a timely operation is the only safety valve in the control of this disease. Delay too often means complications, and complications inevitably mean a large number of unnecessary deaths.

Seemingly it has long been the ideal of many physicians, engendered perhaps by loose teaching and writing on this subject, to get their patients operated on before a rupture takes place. That this is a very inadequate standard, these surveys and the individual experience of every surgeon can testify. There is only one ideal time to operate, and that is before the appendix becomes extensively inflamed. There is only one proper time to recom-

mind and insist on an operation for appendicitis, and that is as soon as a diagnosis can be made, or can reasonably be suspected. Appendicitis is far too treacherous a disease to waste time on an accurate diagnosis. The same is true of some other acute abdominal conditions. Mistakes in diagnosis are going to continue to be made, regardless of the time spent in making them, and it is far better for the patient to make them on the safer side of the ledger, and have a harmless laparotomy relieve some hitherto unsuspected condition, than to wait for more assurance and usher in a full-blown case of peritonitis through pride of accurate diagnosis.

There is another reason for an early operation. The medical profession has long since realized the folly of operating on acute salpingitis. The infection here, even if the salpingitis be puerperal, is probably no more virulent than that in many an inflamed appendix. In salpingitis we wait until the inflammation subsides, or else merely drain a collection of pus. Experience has taught that clamping, ligating and cutting through inflamed tissue is productive of septicemias. But what do we find in a delayed case of appendicitis even though it be unruptured? Here we have a suppurating or gangrenous tissue, probably the site of a thrombophlebitis, certainly loaded with pus and bacteria, which on account of its menace we are bound to remove. We accept the hazard that we refuse in acute salpingitis, and operate in order to escape the greater hazard of an impending peritonitis. No small number of these cases run a septic temperature and die of a blood stream infection, or of a localized infection elsewhere. Da Costa states that the mortality rate from gangrenous appendicitis is greater than that from abscess formation. This has not been the writer's experience, but that experience has been small.

In these suppurating and gangrenous cases, the writer has for a long time practiced placing the ligature or ligatures, as may be needed, as near the base of the mesentery as possible, and as far removed from any inflamed tissue as possible, in order to avoid the danger of septicemia through traumatizing septic and necrotic tissues. At times this can be neatly accomplished. In other cases one has to be content to remove the appendix in any possible way. Probably by avoiding the traumatizing of inflamed tissue, an occasional disaster may be averted.

With a world-wide mortality rate of practically nothing for early acute appendicitis, and a rate of from 5 to 12 per cent for abscess cases, and a rate of from 20 to 30 per cent for diffuse perintonitis, and equally as high or higher rates for other forms of complications, it is certainly incumbent upon the medical profession to use every effort in its power, individually and collectively, to impress upon the public the dangers of delay in this disease.

Nothing has been said in this paper so far about the dangers of purgation in acute appendicitis. As a rule, 90 per cent of all appendiceal cases that die have been purged, but, in addition, the really fatal factor—delay—had been superimposed. Purgatives are bad, yes vicious, as used in acute appendicitis, or in any other acute abdominal pain of unknown origin, but they are as mild as morphine in this disease when contrasted with the deadliness of delay. It is the delay that kills. It is entirely possible that no harm whatever would result from any purgative given early in an attack of appendicitis, unless given as a substitute or preventive of an immediate operation. Of course, to avoid an operation is often the reason for giving or taking a purgative, and, when this is done, it constitutes about the most vicious abuse to which a case of appendicitis can be subjected. Under no circumstances should any doctor administer a purgative for any acute abdominal pain unless he knows specifically the cause for which it is given. The public should be warned by every available means of the danger of taking purgatives for abdominal pain, and of the danger of not seeking medical advice for any acute abdominal pain that lasts for more than a few hours.

It seems to the writer that since appendicitis ranks second only to cancer in the United States as a cause of surgical death, that here is a fertile field for public propaganda. This kind of propaganda is being put on with a vengeance by the profession in an effort to prevent cancer deaths. Why not extend the same publicity to the public regarding their second great danger, appendicitis, and warn them of the dangers of delay and purgation in cases of acute abdominal pain? The public will have to be educated along these lines before any great reduction of mortality takes place. Dr. Boland found in

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the Atlanta survey that the mortality rate was four times as high among the negroes as among the whites, the reason being that it took the negroes twice as long to get to the hospitals as it did the whites, and almost invariably they came well purged with salts and castor oil. The record showed further that every negro who died had taken pre-operative purgatives.

Could there be any stronger indictment of the dangers of delay and purgation, or any greater call to the medical profession for adequate measures of warning to the more ignorant classes of our people? Such a campaign was put on in Philadelphia County —with excellent results. As a rough outline, this was done by distributing to 3,813 doctors 300,000 stickers, warning the public of the dangers of delay in calling a physician, and of taking purgatives for acute abdominal pain, by placing 2,000 placards with a similar warning in all drug stores, and having special lectures given pharmacy students as to the danger of giving purgatives in cases of acute abdominal pain. A careful check-up in one hospital after this campaign had been on for some time showed a 42.3 per cent reduction of mortality. Unquestionably a great deal could be accomplished in any community by a similar campaign.

The question of early diagnosis of appendicitis is highly important. It is not sufficient merely to diagnose appendicitis. It should be diagnosed early, before the inflammation has time to spread, and while an operation can be done with but few chances of failure. The cardinal symptoms and signs of appendicitis, as given in nearly all textbooks, are those of appendicitis and peritonitis combined, and, as such, are grossly exaggerated. There is only one symptom of early appendicitis always present, and that is *pain*. There is only one sign generally present, and that is *tenderness*, but this is absent in 11 per cent of the cases. There is only one corroborative finding, and that is leucocytosis. This is absent in 20 per cent of all cases.

The diagnosis of early appendicitis, as against other acute abdominal conditions, thus simmers down to acute colicky pains, originating in or around the epigastrium, and after a few hours localizing with tenderness in the right side of the abdomen, with leucocytosis as a rule, but a very unreliable rule. All of the other symptoms and signs of early appendicitis are so variable that they are useless in a specific diagnosis.

If doctors would remember that the pain of appendicitis always begins in or near the epigastrium, and then a few hours later settles in the right side of the abdomen, many an error of diagnosis would be avoided.

In assessing the blame for the high mortality rate in appendicitis, the surgical section is quick to deplore the indiscriminate use of purgatives by the public, and the attempts to "freeze it out" on the part of the general practitioner, but rarely does it blame itself for any part of this mortality. That much of this mortality, particularly that in peritonitis, is due to unskilful work on the part of the surgeon, is undeniable by anyone who will look at the record. Dr. Bowers' survey showed that individual surgical mortality varied from 0 per cent to 20 per cent. Some sections of the country show a much wider variation. There is no explanation of this on any reasonable basis, other than that some surgeons learn how to handle peritonitis skilfully, or at least creditably, while others learn nothing at all. The Fowler-Murphy-Ochsner treatment, originated a generation ago, revolutionized the mortality rate from peritonitis throughout the civilized world. With minor deletions and useful amplifications, its sound principles are still the backbone of surgical treatment. In spite of this or any other good example, there are some surgeons who seem to recognize no method of treatment except their own. They are innocent of, or else disregard, the accumulated experience of the medical world on this subject, and with no equipment to pioneer in this field, chase off after the bizarre, the radical, and the spectacular, apparently thinking that Solomon merely abdicated in their favor. They are always the undertakers' best friend.

If there is any patient on earth who needs conservative treatment it is the patient desperately ill with peritonitis. Ochsner pointed this out years ago, and most of the profession recognize the soundness of his conservatism.

If the writer has achieved any success in the treatment of appendicitis and its associated pathology, it has been by pursuing conservative methods, not blindly, but with a determination to stick to a good method until a better one is demonstrated. As stated above, the writer's record in this field is

small. It consists of 290 cases of acute appendicitis, appendiceal abscesses and diffuse peritonitis, with sixty-seven cases of chronic appendicitis, a total of 357, divided as follows:

Acute appendicitis	cases 211	deaths 0
Appendiceal abscess	cases 38	deaths 2
Diffuse peritonitis	cases 41	deaths 6
Chronic appendicitis	cases 67	deaths 1

This gives a mortality rate for the acute cases of 2.75 per cent, and for the entire group a rate of 2.5 per cent. These operations were practically all done in the Petersburg Hospital; a few were done in Hopewell, Va., and still fewer in the Central State Hospital.

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OBSERVATIONS IN THE MANAGEMENT OF ONE HUNDRED CONSECUTIVE CATARACT OPERATIONS.*

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This is a report of one hundred consecutive cataract operations performed at Gill Memorial Eye, Ear and Throat Hospital, Roanoke, Va. In this group are included sixty-six senile, two diabetic, two secondary (cataract extraction was performed elsewhere), twenty-three congenital, two juvenile, and five traumatic cataracts.

The age of the senile group ranges from forty-four years to eighty-one years. In this group of sixty-six operations, thirty-nine were combined extractions, and twenty-seven were performed following a preliminary iridectomy. In regard to the method of operation, sixty-three were extra-capsular, and three were intra-capsular operations. Twenty, or little less than one-third of the extra-capsular operations required capsulotomy at a later date to secure the best vision possible. Two of this group developed detached retinae about ninety days following discissions. On of these had had a vision of 20/20 for two years following the cataract extraction but a discission had to be performed about thirty-six months after operation because of a decrease in vision due to the development of a secondary membrane. A vision of 20/20 was secured after discission until retinal detachment took place. Three conjunctival flap operations had to be performed from four to seven days following cataract extractions because of failure of the incision to heal or because of re-opening of the incision due to trauma. The vision secured ranges from 20/20 to just enough vision to be able to walk about alone. This variation in results is due to the fact that some of these cases were cases of old simple glaucoma, and irido-cyclitis. In no case was the vision entirely lost and in all cases the vision was improved by operation.

In the diabetic group of two cases, age forty-four years and fifty-eight years respectively, both extractions were performed following a preliminary iridectomy. One secured a vision of 20/20 following a discission, but, later, the vision decreased, due to diabetic retinitis. The other case has a vision of 20/40+ but should be improved by capsulotomy as very little retinal change is present. In this group are not included all cases which showed sugar in the urine prior to operation but only those two cases which had been treated for diabetes prior to the failure of vision.

In the secondary cataract group of two cases, both seventy-two years of age, are placed those cases which had extractions performed elsewhere but came in complaining of poor vision. Following capsulo-

*Read before the Virginia Society of Otolaryngology and Ophthalmology, at its annual meeting in Lynchburg, Va., May 5, 1934.

tomy one secured a vision of 20/30 and the other a vision of 20/40.

The age of the congenital cataract group of twenty-three cases ranges from four months to twenty years. In order to secure clear pupils twenty-seven operations had to be performed on the twenty-three cases. The general results were good. The greater proportion of these cases were in a school for the blind and had to be led about. Now all are able to get about alone and attend to their regular duties.

The age of the juvenile group of two cases is twenty years. A total of eight needlings has been performed from time to time in order to retain a vision of 20/20. One of these patients can read, write, sew or perform any of the duties of an ordinary person. Before the development of cataracts she had finished the third year of high school.

In the traumatic cataract group of five cases, ranging from nine years to twenty-two years of age are included four cases who desired to have the "white pupil" removed from their eye, and one case which had a secondary glaucoma due to a dislocated cataractus lens. Two of these cases secured a vision of 20/20 with correction, two a vision of 20/100 with correction, and one needs further operation. The method of operation was needling in four cases, and simple extraction in one case (that of dislocated lens).

PRE-OPERATIVE AND POST-OPERATIVE CARE

Prior to the patient entering the hospital, careful general and special examinations are done. The patient is required to have a general physical examination, including blood pressure, urinalysis, blood count, and Wassermann. Special attention is paid to the possibility of some foci of infection, such as teeth, tonsils, sinuses, and the like. Should the patient be considered a poor operative risk due to diabetes, cardio-renal disease, or some focus of infection, the patient is treated from a general medical standpoint until he is considered safe for operation. At least twenty-four hours before operation the tension of the eye is recorded, the naso-lacrimal duct is irrigated to determine its patency and presence of infection, and a smear from the conjunctival sac is examined for organisms. The patient is required to spend the night preceding the operative day in the hospital. A mild sedative or hypnotic is given in order that the patient may have a good night's rest. About forty minutes before operation a mild sedative, such as codein, is given. About thirty minutes before operation silver nitrate 1 per cent solution is instilled into the conjunctival sac.

Upon entering the operating room the eye is anesthetized with cocain 4 per cent solution or butyn 2 per cent solution. The face and area about the eye is cleansed with green soap and water. The area about the eye is then cleansed with iodine and alcohol, or mercurochrome. The lids are injected with 1 per cent novocain solution, or the facial nerve at the lobe of the ear is injected according to the O'Brien method in order to prevent the patient from squeezing together the eye-lids. In order to secure complete anesthesia of the globe, a subconjunctival injection of 2 minims of 2 per cent cocain solution or of 3 minims of 1 per cent or 2 per cent novocain solution is made. Just before and after the speculum is placed, the eye is irrigated thoroughly with saline or boric acid solution.

Following the operation, 1 per cent atropin solution is instilled, and both eyes are bandaged for forty-eight hours. The patient is required to remain quietly in bed, allowing him to be turned after twelve hours. After forty-eight hours the eye is dressed and as a rule only one eye is bandaged after this first dressing. On the fourth night a cathartic is given. The patient is usually allowed a bed rest the fifth day, and allowed to be up in a chair the sixth day. If no complications develop the bandage is removed the eighth day and the patient allowed to go home the tenth day. Upon going home the patient is instructed to use hot compresses for ten minutes three times a day. If no secondary membrane is present, glasses are prescribed about sixty to ninety days after operation.

CONCLUSIONS

Regardless of the fact that this series of cases show more combined extractions than extractions following preliminary iridectomy, our opinion is that extraction following preliminary iridectomy is a safer operation and the results are better. The operator has an opportunity to learn the patient's reactions and to know what to expect when the cataract is extracted.

No cases showed any infection following operation, although two of our cases had lost one eye following an operation elsewhere. We attribute the

absence of infection to careful preliminary preparation and examination.

All cases performed by the intra-capsular method got good results. However, we consider the extra-capsular method much safer and the final results just as good. *711 South Jefferson Street.*

ABDOMINAL EMERGENCIES.*

M. H. TODD, M. D.,
Norfolk, Va.

Abdominal emergencies, whatever their nature, give rise to somewhat the same general group of symptoms—that is, pain, tenderness, muscle spasm, nausea or vomiting, rise in the leukocyte count, and later on fever and rise in pulse rate In each type of emergency, however, there is a predominance of one or another symptom. Thus, in perforation of stomach or intestine, muscle spasm is the outstanding feature; there is rigidity that is board-like and completely involuntary, and the patient cannot relax his abdominal wall for a moment, no matter how he may try. In acute appendicitis, the outstanding feature is a localized area of tenderness to deep pressure; this is nearly always present, no matter what other classical symptoms and signs may be lacking. In intestinal obstruction, severe cramping pain coming in paroxysms is most prominent in the picture; and a little later, distention. In ruptured ectopic pregnancy, the prominent syndrome is that of shock and internal hemorrhage; in acute pancreatitis, shock.

In general, most of the abdominal emergencies are impressive enough in their signs to signify that something serious is wrong; but sometimes no better diagnosis can be made than that of an acute surgical abdomen.

Abdominal emergencies fall into two groups—those due to injury, and those due to disease. Let me discuss them briefly in these groups.

Emergencies due to injury often present no special difficulty in diagnosis, because there is penetration of the abdominal wall by a knife or a bullet in such a way that the intestine must have been injured, and the need of immediate operation is evident to everyone, including the patient himself.

Sometimes there is doubt about intestinal injury, the wound being perhaps tangential, or a knife wound possibly being only a shallow one; in this case, a good deal of dependence can be placed on the X-ray. The patient is held sitting for a moment, and a film is taken with the X-ray horizontal at the level of the top of the liver, when any escaped gas, even a few c.c., can be seen with startling clearness as a clear curved line between liver and diaphragm.

This use of the X-ray is especially necessary when simply an abdominal contusion has occurred, such as a mule-kick, with no external wound. I wish to emphasize that in such cases, the symptoms of intestinal rupture are apt to be slow in developing; and that the patient may look and feel really quite well for many hours, with no fever or rise in pulse, and still have a rupture of the bowel. There is generally some stiffness of the abdominal muscles and some tenderness, but of course the contusion of the abdominal wall itself could cause these signs. The rapid rise in the leukocyte count ought to help; I have seen it rise in one hour from 6,000 to 40,000. But the X-ray will imperatively point to operation if any gas is shown above the liver, thus settling the problem at once.

Injury to liver, spleen or kidney will give rise to hemorrhage, and thus, if severe, to the signs of internal hemorrhage, when it is again necessary to operate. The spleen, if badly torn, is to be removed; bleeding from the liver has to be controlled by packing or careful deep suture, or both. Sometimes bleeding from the kidney is severe enough to make operation necessary, generally nephrectomy; but in general, kidney wounds are apt to heal if left alone; there is some danger of secondary bleeding later. Injury to the bladder is not always easy to be sure about; the injection of much fluid, or more particularly air, is dangerous; cautious use of radiopaque fluids, or intravenous urography, with the X-ray, give the most reliable information. Such wounds require suture and drainage.

*Read before the Southside Virginia Medical Association at Suffolk, June 12, 1934.

Simple penetrating wounds of the peritoneum itself, by the way, ordinarily take care of themselves perfectly well if simply left alone; operation is only needed if there is visceral injury.

Injuries to the pancreas are uncommon; they give rise to a collection of fluid which presents after a week or so as an epigastric cyst, and this, when drained, leaves a pancreatic fistula. I have such a case now under observation in the stage of the fistula.

Let me now speak briefly of abdominal emergencies due to disease; they are mostly comprised under the general headings of perforation and of obstruction.

Acute perforation of the stomach or intestine, from ulcer, causes, as a rule, such unmistakable rigidity of the abdominal wall that it would not ordinarily be overlooked. I have mentioned this above. Let me call attention to the fact that in a goodly percentage of these cases there is no history of any previous indigestion at all, the perforation coming on out of a clear sky; and let me mention again the great service in diagnosis that can be rendered by the X-ray.

Perforation of the appendix is pretty familiar to you all, for appendicitis is by far the most common of all the abdominal emergencies; but, if you will permit, I should like to say again, as I have emphasized in other papers, that the diagnosis cannot be made with real certainty; that perforation may be present when there are only mild signs of trouble; that fever and rise in pulse are late, not early symptoms; that real rigidity of the overlying muscles is not at all a constant finding; and that the leukocyte count is by no means necessarily an accurate indication of the severity of the trouble. The patient's face may be perfectly tranquil and bright; there may be no nausea; indeed, there may be an appetite for food; there generally is a perfectly definite local tenderness, as I have stated. There is only one path of safety for the patient with appendicitis—operation as soon as the diagnosis is reasonably suspected. Delay too often means peritonitis.

Intestinal obstruction is a calamity that to my mind is harder to definitely diagnose than any other abdominal emergency. Cramping pain is for some time the only symptom present. There is for some time little distention, no fever or rise in pulse rate, no stiffness of the abdominal wall, and not much if any tenderness. Furthermore, enemas will produce results for some hours, and this fact adds to the puzzle. If hernia is the cause, there will be swelling and tenderness over it if inguinal; but in the case of femoral hernia, strange as it may seem, there is quite often no local tenderness or swelling at all, even in the presence of strangulation.

Formerly, it was necessary to wait a while and see; nowadays the X-ray has come to the rescue again, showing gas distention of the small intestine, with fluid levels below the gas if the patient is erect. This finding, however, is also present in obstruction of partial or intermittent grade, and therefore must be interpreted with care. Note that no barium is to be used, for this makes the obstruction only worse.

Up until recently, there was only one treatment—operation, with release of constricting bands, or enterostomy, or resection, as indicated. Recently, however, several authors, Wangensteen, Orr, the Bartletts, and others, have been able to avoid operation in a number of cases by using the inlying duodenal tube with suction, sustaining the patient by giving fluids by vein. This is strictly a method for cases without actual strangulation; in doubt, it is necessary to operate, the penalty for delay in strangulation being an inevitable peritonitis.

Post-operative ileus, which is similar to obstruction and may be confused with it, may be relieved by duodenal tube suction; and more recently a new drug has come to the fore, particularly at Bellevue in Potter's wards—pitressin, given deep intramuscularly every four hours. I have seen it work like a miracle in several patients of my own, relieving a situation that foreshadowed the greatest peril.

A not very infrequent abdominal emergency is rupture of a tubal pregnancy; here the main symptom, beside local pain, is shock from internal hemorrhage. The diagnosis is not generally hard to make, or at least suspect; treatment is immediate operation, with simultaneous transfusion if possible; otherwise, intravenous acacia. After the abdomen is opened, it is entirely proper to citrate the patient's own blood and give it into a vein, and in the absence of a donor this may save life. I have seen a patient with a blood pressure of 60, in air-hunger, at the time of incision, restored to a normal pink color and a pressure of 130 by the time the abdomen was closed. By the way, this procedure,

auto-transfusion, can be used in the case of ruptured spleen; it is said that a ruptured liver changes the blood enough so that it should not be used.

Ruptured ectopic is one of the few conditions, in shock, in which it is necessary to operate at once; in traumatic cases, this is not proper; wait a couple of hours for shock to subside.

Allow me to mention that there are unrelated conditions that may closely mimic the symptoms of abdominal emergencies, and are to be remembered in differential diagnosis; they vary from coronary occlusion to spider-bites, from lead-poisoning, heat-cramps and gastric crises, to pneumonia in children. I simply call attention to their possibility; you have no doubt been confronted with them.

Will you allow me to state again a few fundamentals, with which I know you are all perfectly familiar? Abdominal emergencies are to have no food by mouth, no opiates until the diagnosis is certain, and above all, no laxatives. Analysis in a recent article showed a death rate eight times as high in acute appendicitis cases that had taken laxatives, as in those who had taken none.

Personally, I do not use the ice-cap in acute appendicitis; for more than once it has acted just like an opiate, concealing the very tenderness that I was trying to depend upon to make the diagnosis.

And, finally, do not wait for all the classical signs of trouble to make themselves fatally evident. I have painful recollections of a physician who would never refer me an appendicitis patient for operation unless he had a rise in temperature; so that I got all his cases late, and they were always unusually bad ones.

It is only by early operation that peritonitis can be forestalled, and it is imperative for the patient's life that it be prevented.

712 Botetourt Street.

ACUTE CONGESTIVE GLAUCOMA IN A PREVIOUSLY HYPOTONIC EYE—A CASE REPORT.*

ROBERT H. COURTNEY, M. D.,
Richmond, Va.

For many years it has been known that a characteristic finding in diabetic coma is a soft eye. There have been only a few published references to it but it seems to be an accepted differential point in coma. According to Patek, Krause, in 1903, was the first to call attention to hypotonia in diabetic coma, and shortly thereafter Heine corroborated the finding. In 1916 David Reisman called attention to the findings of Krause and Heine. Middleton reported two cases in 1922, while Patek reported five cases in 1929. Since Patek's reports, hypotony in diabetic coma has been commonly observed. So far as a brief review of the literature reveals, I have been unable to find any reference to hypotony in diabetes without coma. Neither have I been able to find reference to acute congestive glaucoma occurring in a previously hypotonic eye.

CASE REPORT

Mr. W. G., aged 67, consulted us in April, 1933, because of dimness of vision and distortion of objects. The fundi showed very marked arteriosclerosis of the retinal vessels, hemorrhages scattered throughout both retinae and old placques, suggestive of diabetes, around each macula. The vision could not be improved to above 20/80 in each eye. His family physician reported that the patient had been under treatment for diabetes for some time but that his directions as to diet had been carried out indifferently. Examinations of the fundi were made at monthly intervals for the next eight months and at no time were the retinae free from fresh hemorrhages. At each visit the eyes seemed quite soft on digital examination. The visual fields showed numerous small scotomata about the fixation point but were otherwise normal. In January, 1934, he returned because of severe pain in the right eye. At this time there was quite marked edema of both right lids and chemosis of the conjunctiva; there was only slight ciliary injection; the cornea was somewhat steamy; the pupil dilated ovally and fixed; the vessels of the iris were quite engorged. There

*Read before the Virginia Society of Otolaryngology and Ophthalmology, at its annual meeting in Lynchburg, Va., May 5, 1934.

was only a moderate decrease in the depth of the anterior chamber. On palpation the eye felt quite firm and it was indeed much firmer than the left but, measured with the Schiotz tonometer, it was found that the tension of the right eye was only 27 mm. of Hg., while that of the left eye was 10 mm. of Hg. In the presence of such brittle vessels and engorgement of the iris vessels it was deemed unwise to do any operation for the relief of tension. He was, therefore, given a mixture of eserine and pilocarpine. On the following day the patient stated that the pain was less. The tension was reduced to 18 mm. of Hg., but there was no other objective change in the eye. During the next eighteen days the tension remained at 18 to 20 mm., but the eye remained painful, congested, the cornea dewy, and the pupil somewhat dilated. Enucleation was performed on February 14th. Since enucleation of the right eye there has been no appreciable change in the condition of the left eye, the tension remaining at 10 mm. Hg.

Sections of the right eye for pathological study showed the usual changes to be found in congestive secondary glaucoma and nothing remarkable. The cornea was normal. There were rather extensive anterior synechiae; the iris was very edematous; the ciliary processes were atrophic; cystic degeneration of the retina with an occasional retinal hemorrhage was present, and a shallow glaucomatous cup of the optic nerve clearly defined.

The more interesting points in this case to which I wish to call your special attention are, first, the occurrence of hypotony in a diabetic whose sugar level was well under control; second, the complete picture of congestive glaucoma in an eye without an elevation of intra-ocular tension, as measured with the tonometer, above what is usually considered the normal, but in which there was in reality a tension more than two and one-half times greater than that of the fellow eye; and, third, while the tonometer registered a practically normal tension, digital tonometry gave the impression of a rather tense sclera.

Are the symptoms of acute congestive glaucoma due to increased tension, or are they mainly due to congestion? Is it possible, in the presence of atrophic ciliary processes, to have an increase of tension in the posterior segment without influencing the corneal tonometry?

Professional Building.

Correspondence

New Treatment for Duodenal Ulcer.

TO THE EDITOR:

I wish to make a preliminary report of a case of duodenal ulcer, the clinical diagnosis of which was confirmed by skiagraph. This case was first seen November 16, 1934, and was treated with Larostidin (Hoffman-La Roche). At the end of the prescribed treatment, the radiologist reported "Not entirely healed, but marked improvement."

A detailed report of the case will be given later.

RAMON D. GARCIN, M. D.

Richmond, Virginia,
January 4, 1935.

Public Health Statistics

I. C. RIGGIN, M. D.
Health Commissioner of Virginia

The communicable disease report received at the office of Dr. G. F. McGinnes, State Epidemiologist, during December, 1934, showed the following cases compared with the same month in 1933:

	1934	*1933*
Typhoid and Paratyphoid Fever	46	63
Diphtheria	238	338
Scarlet Fever	485	609
Measles	818	439
Meningitis	8	10
Poliomyelitis	2	3
Rocky Mountain Spotted Fever	0	0
Typhus Fever	0	0
Undulant Fever	3	1
Tularaemia	17	30
Smallpox	16	0

A study of the cases of communicable diseases reported to the State Department of Health for the year ending December 31, 1934, reveals many interesting facts. Though in general the number of cases reported this year was less than in the preceding, small epidemics of some of the unusual diseases should be noted.

An outbreak of poliomylitis in Wise County made the number of cases of this disease the highest reported since 1930. The low level of ten cases of smallpox in 1933 is exceeded this year by fourteen cases, because of two small epidemics in Washington County in October and December. Trachoma is another of the diseases showing a marked increase due to a report of seventeen cases in Wash-

ington County for the month of May. Malaria has very nearly a 33 per cent increase because Southampton and Surry counties both had epidemics in August and September.

On the other hand, the increase in the number of cases of cerebrospinal meningitis cannot be attributed to any localized outbreak but is due to sporadic cases scattered throughout the State. At no time was there any danger of an epidemic. The reported number of cases of Rocky Mountain spotted fever has increased every year since 1931 when it was first separated from typhus fever and 1934 proved no exception. The number of cases this year approximately doubled the number of 1933. However, this does not necessarily mean that the disease is more prevalent, for more careful diagnosis accounts at least in part for this increase.

During the summer of 1934 Virginia experienced its third epidemic of the unusual disease, Dabney's grippe. In 1888 William C. Dabney, whose name the disease bears, described and recorded an outbreak in this State. Again in 1923 interest was revived when another epidemic occurred in the northwestern part of the State. The sporadic occurrence, sudden onset and violent symptoms, make this disease one of peculiar interest and caused it to be dubbed "Devil's Grippe" by its victims. A few cases of unusual flu reported at the end of July this year, were the beginning of the epidemic of Dabney's grippe which rose rapidly to a peak in August and declined abruptly in September.

Since measles has practically a 100 per cent attack rate it is one disease which is epidemic roughly every four years. An epidemic attacks most of the susceptibles and the following years the number of cases is comparatively few, while a new susceptible population is growing up. The peak of the 1933-1934 epidemic of measles was in March. However, this was not alarming for most of the cases were among school children, the group to which public health workers are trying to confine this disease.

In contrast to these diseases are those having a marked decrease in the number of cases reported. The typhoid, paratyphoid, typhus and pellagra reports are the lowest on record for these diseases, and tularaemia, undulant fever, diphtheria, diarrhea and dysentery, chickenpox, whooping-cough, encephalitis and tetanus all had fewer cases than in the preceding year. The other reportable diseases, scarlet fever, tuberculosis, influenza, ophthalmia neonatorum, mumps, syphilis and gonorrhea have approximately the same number of cases each year.

Miscellaneous

TO LOVED PHYSICIANS EVERYWHERE

To One In Particular—

My Husband

ETHEL S. ARMISTEAD

We ask so much of one who comes
In hours of weakness with his strength,
Who enters our familiar rooms,
To anxious hearts
His confidence imparts.
And when the Spectre of the Unknown looms
His knowledge calms and quiets us at length.

We give so little in return
To one who gives us not alone
Advice for which we ask, and pay—
But gives us more,
That something from his store
Of fathering the world from day to day,
And answering its suffering, helpless moan.

He comes to us, our outstretched hands,
And our demands to "Find some power!"—
To "Save this life!"—"Our hope renew!"—
To waiting hearts
His courage strength imparts;
When skill with drug or knife is powerless too
He grieves to be but mortal in Death's hour.

I wish that lives so spent in service
Might one day find waiting cheer
From words that grateful hearts would say;
And when at last,
Strength gone and vigor passed,
He outlives usefulness and crowded days
May faithful care be his when night draws near.

The cooling cup he held to many a lip
May one remember, bring to him to sip
Who gave his strength, his rest, his days, his nights
To help the helpless in the fight of fights.
No term has quite the glory of that word
That links his healing with one called of God.

"Beloved Physician"

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1325 3rd St., Roanoke, Va.

Woman's Auxiliary to the Medical Society of Va.

President—MRS. JOSEPH BEAR, 3012 Monument Ave., Richmond.
President-Elect—MRS. FLETCHER J. WRIGHT, Petersburg.
Recording Secretary—MRS. JAMES B. STONE, 2042 Park Ave., Richmond.
Corresponding Secretary—MRS. AMBROSE MCGEE, 4107 Kensington Ave., Richmond.
Treasurer—MRS. REUBEN F. SIMMS, 2034 Park Ave., Richmond.

Auxiliary to Postgraduate Medical Society.

The members of this Auxiliary had their second annual shower for the benefit of the Petersburg, Va., Hospital on January 29th. All church organizations, including the Negro members of the community, cooperated to provide sufficient sheets, towels, pillowcases and blankets to carry the hospital through another year. Sponsored by wives of members of the medical profession, the in-gathering netted more than $500.00 worth of materials in 1934 from the support of various church groups and individual donations. The value of the articles for this year had not been estimated at the time of this going to press.

The general committee in charge of the work this year was composed of Mrs. H. M. Snead, Mrs. Meade Edmunds, and Mrs. Philip Jacobson.

Auxiliary to the Richmond Academy of Medicine.

Mrs. Andrew G. Shetter was elected president and Mrs. W. Ambrose McGee, president-elect, of the Auxiliary to the Richmond Academy of Medicine at a recent meeting.

These officers and the others elected January 11th, who are Mrs. T. B. Washington, vice-president; Mrs. F. J. Wampler, recording secretary; Mrs. F. W. Shaw, corresponding secretary; and Mrs. J. O. Fitzgerald, treasurer, will be installed at the February meeting.

The retiring president, Mrs. J. B. Stone, gave a report of the activities of the organization during her term of office. Five guest speakers spoke at meetings. The president of the Auxiliary to the Medical Society of Virginia attended one of the meetings and spoke on the work of the auxiliary, a play was sponsored during the year, volunteer clerical aid was given in the diagnosis campaign of the Richmond Tuberculosis Association, and milk was supplied each school day to twelve undernourished children in the public schools of the city. In November a reception-tea was given honoring the wives of all members of the Richmond Academy of Medicine.

In retiring from office, Mrs. Stone presented to the Auxiliary a scrapbook containing items of interest she had collected in regard to the local organization.

Attention, Physicians' Wives!

Mrs. Joseph Bear, State President, urges all physicians' wives, whether affiliated with auxiliaries or not, to read the articles by National Auxiliary officers, which appear each month in the *Bulletin of the American Medical Association*. They contain news of work accomplished throughout the country and will prove profitable as well as interesting.

Truth About Medicine

In addition to the articles previously enumerated, the following have been accepted by the Council on Pharmacy and Chemistry of the A. M. A.:

Grisard Laboratories
Chocolate Coated Tablets Scillonin, 0.5 mg.

Lederle Laboratories, Inc.
Diphtheria Toxin for Schick Test in Peptone Solution, fifty test package
Staphylococcus Toxoid

Eli Lilly & Co.
Ampoules Sodium Amytal, 0.065 Gm. (1 grain)
Tablets Amytal, ⅛ grain

National Drug Company
Diluted Diphtheria Toxoid for Sensitivity Test, 5 and 50 test packages

Winthrop Chemical Co., Inc.
Tablets Skiodan, 1 Gm.

The following products have been accepted for inclusion in the List of Articles and Brands Accepted by the Council But Not Described in N. N. R. (New and Non-official Remedies, 1934, p. 443):

Lederle Laboratories, Inc.
Quinidine Sulphate (Lederle)
Capsules Quinidine Sulphate (Lederle) 3 grains (0.2 Gm.)
Capsules Quinidine Sulphate (Lederle) 5 grains (0.325 Gm.)

Propaganda for Reform

Report of the Council on Physical Therapy.—Physical therapy was in a chaotic condition at the time of the organization of the Council on Physical Therapy by the Board of Trustees in 1925. The chaos that existed was due to the activities of manufacturing agents who were selling apparatus directly to the physicians and to hospitals for "machine therapy." The profession was losing sight of the fact that true physical therapy consisted chiefly of intelligent hand work—namely, heat, massage and exercise—and that expensive machines and apparatus played a minor part in the realm of physical therapy so far as the majority of the profession was concerned. With the conditions confronting the newly formed Council, it can be readily understood that the first two or three years of the Council's existence were devoted to self-education of its members; to formulating rules of procedure that could withstand criticism; and to months—even years—of study of certain physical phenomena used in physical therapy before it could refute or approve the therapeutic claims made by certain manufacturers. From a summary of the past work of the Council it can be stated that physical therapy is now in much better repute with the entire profession than it was at the time the Council was organized.

Then justifiable skepticism was warranted by the misuse of physical therapy. Today patients are receiving more and more of that type of physical therapy that is of real value to them. There is still a great amount of work to be done and the Council will continue to guard zealously this field of physical therapy in order to prevent all irregular practices and to strive to enlarge its scope and usefulness for the benefit of the profession and the public at large. (Jour. A. M. A., December 8, 1934, p. 1776.)

Book Announcements

Synopsis of Genitourinary Diseases. By AUSTIN I. DODSON, M. D., F. A. C. S., Richmond, Virginia. Professor of Genitourinary Surgery, Medical College of Virginia; Genitourinary Surgeon to the Hospital Division, Medical College of Virginia, etc. 12mo. of 275 pages. With 111 illustrations. St. Louis. The C. V. Mosby Company. 1934. Leatherette. Price, $3.00.

The medical compend is too often either a disappointment to those competent to give it critical estimation; or else a snare to those more trustful souls who are lured by its sweeping, sometimes dangerous, generalizations. Very occasionally such a booklet squarely meets its mission and it becomes then of very distinct value and usefulness not only to the harried student or the busy practitioner but also to the specialist, who finds himself solidly enjoying a bird's-eye view of the fundamentals of his work, stripped of the vast accumulation of contributory data.

It is a pleasure to recognize in this synopsis by a Richmond urologist a conspicuous example of this latter desirable type of manual. As can be readily understood, the best effort in such a direction is likely to come from the hands of a teaching clinician who is compelled by force of circumstances to compress within a curriculum of limited hours the whole scope of a field to which he is devoting his own entire time and thought. Dr. Dodson's duties in the classroom, combined with his wide experience and competence as an active genitourinary surgeon, have served him admirably and the result is wholly commendable.

The text is well arranged and sufficiently illustrated with a few photographs and numerous illuminating pen and ink drawings. The essential anatomy of the urogenital tract, so necessary to an understanding of its pathology and therapeutics, is adequately described and there is a brief but very helpful introductory chapter upon the underlying principles of urologic diagnosis. Instruments and minor procedures that may be appropriately assumed by the novice or the general practitioner are considered in some detail but the more complicated diagnostic and surgical technique is wisely omitted since it could serve no other purpose than to confuse the picture. Separate chapters are then devoted to the various disorders encountered in the genitourinary system and as one inspects this little volume minutely, it is surprising to note the thoroughness and soundness with which this great field has been covered. With no waste of words and yet with sufficient regard for the requirements of lucid exposition, the author in brief, pointed paragraphs provides an insight into all the problems of urology—with one exception. The book is deficient in its attention to the functional disorders so conspicuous—and so troublesome—in this field. Dr. Dodson is well aware of this omission and in the subsequent edition, which will certainly be required of him, will remedy this oversight so far as may be practicable with a subject often baffling to the most skillful urologist. Not the least attractive feature of the book is an excellent index, something not invariably present even in works of much greater pretension.

It is easy to predict that this admirable synopsis will find a ready place not only in the college for

which it was primarily designed but in many other institutions as well, to say nothing of the general practitioners who will look to its brief pages for safe, easily assimilable advice and instruction.

JOSEPH F. GEISINGER.

Periodic Fertility and Sterility in Women. A Natural Method of Birth Control. By PROFESSOR HERMANN KNAUS, Head of the Clinic for Gynecology and Obstetrics of the German University of Prague. With a Foreword by Professor F. H. A. Marshall, F. R. S., Cambridge. Authorized English Translation by D. H. Kitchin and Kathleen Kitchin, London. Vienna. Wilhelm Maudrick. 1934. Octavo of vi-162 pages. Cloth. Price, $6.50 postfree.

Professor Knaus is well known for his important investigations in the physiology of reproduction. In this volume he has collected his own researches and those of others in a fascinating manner in the support of his thesis that the human female is fertile for only a short period in her menstrual cycle. This is known to be true in animals, but its application to woman has been so fraught with apparent contradictions that it is generally believed that conception may occur at any time in the menstrual cycle. Our author has attacked the problem from a biological standpoint in a masterly manner. He shows *in vitro* that the optimum temperature for spermatozoa of warm-blooded animals is between 10° and 15° C. Furthermore in the body, heat is inimical to them. The epididymis is the storehouse for spermatozoa and the seminal vesicle is a misnomer. The function of the scrotum is a heat regulatory, or rather a refrigeratory, one. In the tail of the epididymis with its relatively lower temperature and its increased CO_2 tension spermatozoa retain their motility and fertility for weeks, but at body temperature they deteriorate in a few days. This explains the sterility of cryptorchid and is true when this condition is produced artificially. It also explains why the spermatozoa in the female genital organs of a rabbit remain fertile for a maximum of thirty hours and motile for only forty-eight hours at the most. The spermatozoa of all mammals with scrotal testicles lose their fertility within forty-eight hours of coitus under the influence of abdominal temperature to which they are exposed in the female genitalia, and of the alkaline secretion of the accessory male sex glands with which they are mixed during ejaculation.

In a like manner Knaus attacks the question of the time in which the ovum may be fertilized. The ripening of the ovum is a degenerative process and proceeds without remission unless it becomes fertilized by the spermatozoa. When the ovum is extruded from the follicle and begins its journey towards the tube it is surrounded by a laminated covering of follicle cells loosely attached to the surface of the ovum. In a very few hours after ovulation they are shed completely, leaving a smooth spherical surface, which starts to clothe itself in an albumin sheath, much as a bird's egg does in its passage through the oviduct. An extremely thin coating of albumin is sufficient to prevent the ingress of a spermatozoon. The law that the ovum is only fertilizable for a few hours after ovulation applies to all warm-blooded species.

If the spermatozoa remain fertile for only forty-eight hours in the female genital tract and the ovum is fertilizable for only a few hours, the problem then is to determine the time of ovulation. In the human female this has been a baffling one. Gynecologists have attempted to solve it by noting the stage of development of the corpus luteum at operation upon patients at various days of the menstrual cycle. This has led to conflicting opinions. Newell and his co-workers washed out the tubes at operation, collecting the ova when present in sterile petri dishes. From an examination of such ova they were of the opinion that ovulation took place between the 12th and the 14th day of the cycle. Knaus attached the problem in a very ingenious way. The presence of the corpus luteum inhibits the contractions of uterine muscle and renders it unresponsive to the action of extracts of the posterior pituitary. He devised an apparatus for recording the contractions of the normal human uterus *in situ*. By testing the response to the injection of pituitrim at various times in the menstrual cycle, he showed conclusively that the duration of the corpus luteum was fourteen days irrespective of the type of menstrual cycle. In other words ovulation occurred fifteen days before the oncoming menses. In the light of this work one can paraphrase Fraenkel's old adage "The only regular thing about regular monthly period is its lack of regularity" to "the only regular thing about the monthly period is the duration of the corpus luteum." If a woman keeps a record

of the onset of her menstrual periods she can very definitely fix the time of ovulation on the chart fifteen days before each period. In the course of a year according to Knaus, she can know accurately just when in her menstrual cycle she is fertile. The ovulation date is that period which falls between the ovulation days of the shortest and longest cycles. Conception can take place only during this time and the two days immediately preceding it. When he takes the responsibility of advising women concerning the days in the menstrual cycle on which they are unlikely to conceive, he lengthens the conception period as determined in this way by a day at the beginning and a day at the end.

The book makes interesting biological reading and it is fascinating to follow the experiments the author outlines in arriving at his conclusions. The proof reading seems to be poorly done. On page 80 it is stated "This evidence bears out the opinion that spontaneous and forced ovulation can occur together in the same organism," when it is evident it means it cannot occur. In a case report on page 97 "In 1933 after a normal confinement she was delivered of a living child. In 1924 she suffered from inflammation of both tubes and ovaries." One would imagine that the real date of confinement was 1923 especially as both tubes were removed in 1926.

M. PIERCE RUCKER.

Report on Seventh International Congress of Military Medicine and Pharmacy and Meetings of the Permanent Committee. Madrid, Spain, May 29-June 3, 1933. By CAPTAIN WILLIAM SEAMAN BAINBRIDGE, MC-F., USNR., New York, member of the Permanent Committee. Delegate from the United States. Octavo of 88 pages. Cloth.

Proceedings of the Twenty-Eighth Annual Convention of the Association of Life Insurance Presidents. Held in the Waldorf-Astoria, New York. December 13 and 14, 1934. Printed in U. S. A. Octavo of 240 pages. Paper.

New Books at the Library of the Medical College of Virginia.

The following books, received recently at the Library, are available to our members, the only cost being return postage:

Bell, E. T.—The Search for Truth.

Bolton, J. S.—The Cortical Localisation of Cerebral Function.

Brown, Wm.—Psychology and Psychotherapy.

Bundensen, H. N.—Dr. Bundensen's Diet Book.

Burridge, W.—A New Physiological Psychology.

Caldwell & Lundeen—Do You Believe It?

Charles, E.—The Twilight of Parenthood.

Clendening, L.—Methods of Treatment. 5th ed.

Coombs, C.—Rheumatic Heart Disease.

Crowther, J. G.—The Progress of Science.

Drinker & Field—Lymphatics, Lymph and Tissue Fluid.

Frank, G.—America's Hour of Decision.

Harrington & Wolseley—The Copyreader's Workshop.

Heine, L.—Uber Haftglaser.

Hemmeter, J. C.—Master Minds in Medicine.

Hirsh, E. W.—The Power to Love.

Jeans, J.—Through Space and Time.

John, H. J.—Diabetic Manual for Patients.

Kirkpatrick, E. A.—Mental Hygiene for Effective Living.

Krecke, A.—The Doctor and His Patients.

Larsell—Jöns Jacob Berzelius.

Marlin, T.—Manipulative Treatment for the Medical Practitioner.

McConnel, J. K.—The Adjustment of Muscular Habits.

McFarlane, J. E. C.—The Case for Polygamy.

Medical Research Council, Special Report Series.
No. 190—A Study of Growth and Development.
No. 192—Housing Conditions and Respiratory Disease.
No. 195—Active Immunization vs. Diphtheria.
No. 196—The Inheritance of Resistance up to Bacterial Infection in Animal Species.

Metalnikov—Role du Systeme Nerveux et Des Facteurs Biologiques et Psychiques dans L'Immunite.

Mohr, O.—Heredity and Disease.

Moore, F. J.—A History of Chemistry.

Phillips, M. C.—Skin Deep.

Ricketts, P. C., Amos, Eaton, author, teacher, investigator—B. Franklin Greene and the Reorganization in 1849-50.

Sigerist, H. E.—American Medicine.

Sigwald, J.—Le Sucre Agent Therapeutique.

Stitt, E. R.—Diagnostics and Treatment of Tropical Diseases.

Stitt, E. R.—Practical Bacteriology, Blood-Work and Animal Parasitology.

Stone, C. T.—The Dangerous Age in Men.

Sutton, R. L.—Disease of the Skin. 9th ed.

Sylvest, E.—Epidemic Myalgia.

Vehrs, G. R.—Spinal Anesthesia.

Voge, C. I. B.—The Chemistry and Physics of Contraceptives.

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Editorial

On Reading the Annual Reports of the State Hospitals for Mental Patients.

What does the average doctor know about how his state is caring for its large insane population? What does he know about psychiatry and the directions of psychiatric progress? And are these questions interrelated?

He perhaps knows that the first insane asylum in this country was at Williamsburg, and that in Virginia the Negro suffering from mental disease was first institutionalized. He may be acquainted with the fact that today the State of Virginia supports five enormous institutions dedicated to the care of the insane, the feebleminded and the epileptic; that the population of all of these institutions is close to ten thousand; that they are maintained by yearly appropriations of more than a million dollars; that they represent a capital outlay of many more million dollars; and that none of them adequately meet the demands made upon them. He is conscious that great progress has been made since 1676 when Bedlam was in operation; since 1792 when Pinel struck the chains from these unfortunate people; since the middle of the Nineteenth Century when it first dawned upon the world that insanity was a disease manifestation and not demoniacal possession. He has heard of and taken pride in the progressive attitude of his state in the matter of the sterilization of the feebleminded and he is pleased to know that next to California the State of Virginia outranks all other states of the union in the number of such eugenic procedures. He recalls that all of these institutions were once called asylums and now they are known as hospitals and he interprets that to mean progress and so it was meant to be. Still the question arises, have we yet fully deserved the right to that distinction? Are our State institutions (for the great majority of patients they harbor) asylums for detention or hospitals for diagnosis and treatment?

Does the average doctor realize that the insane are often still being lodged in jail pending commitment and this for lack of some type of local intermediary station—reception hospitals—in which they may be housed and properly classified while waiting acceptance by the State hospitals in which overcrowding prevails and where painful delay often retards the process of commitment. Does he appreciate the need for local hospitals for the reception and study of mental cases in the early and curable stage with up-to-date outpatient departments and teaching connections, such as the Maudsley Hospital in London? Does he realize the importance of prevention and of mental hygiene in the schools, or how much improvement in the psychiatric teaching of both doctors and nurses is still possible and how little the vast array of clinical material in the State is being utilized? Does he know

how little the population at large has been educated along the lines of the proper care of the insane and the possibilities of child guidance clinics and community service in the indoctrination of the tax paying public with a sense of its responsibility toward mental disease?

Every doctor who reads the Annual Reports of the State Hospitals which are before us will no doubt be surprised to find that on only two of the five special boards which consist of three members each is the medical profession represented, in each instance by only one doctor. Which means that when the general board convenes, made up as it is of all the special boards only two of its fifteen members are physicians. There should be at least one doctor on each special board—better still if a majority of the board was composed of physicians. More physicians on the boards would perhaps result in a different allocation of expended funds. For example even a superficial scrutiny of what is apparently the policy of all of these hospitals is sufficient to convince the interested person that all of them are constantly in the midst of physical expansion. There is not a hospital in the State that is not engaged in erecting some new building, but it must be apparent even to the uninitiated, that in all of these hospitals there is a striking dearth of skilled personnel. The great Central State Hospital at Petersburg, with more than 3,000 patients, has only eleven trained nurses and four physicians besides the superintendent. More medically minded boards would be expected to agitate for funds for research and for the more careful study of this large institutionalized fraction of our population. They would at once sense the need for more physicians, more trained nurses, and better equipment. Such boards would appreciate the fact that after all these are general hospitals and should be so equipped and so operated. They would provide means for more thorough post mortem studies, securing the services of trained pathologists in both gross and microscopic diagnosis and they would make the section available not only to the staff, but to practicing physicians and medical students as well. They would see the need for better segregation of patients, and they would appreciate the vast educational possibilities of these institutions, and in doing so they would quickly find the means to tie them intimately to the two medical schools of the State. They would also see the possibility of making each and every institution a great center of postgraduate education for the doctors of the State of Virginia.

The Louse in History.

Hans Zinsser's *Rats, Lice and History,* a foretaste of which appears in the January issue of the *Atlantic Monthly* promises to be an informative as well as interesting book, because the distinguished professor of bacteriology at Harvard not only "knows his stuff" but enjoys the reputation of being able to write. The article before us is an entertaining account of the louse in history. The louse was introduced into literature years ago by Robert Burns in lines that will always be remembered. In society the louse needs no introduction since he was living with man on terms of the greatest intimacy at the dawn of civilization.

Medicine is interested in the louse primarily because of its relation to typhus fever. Zinsser points out that he "shares with us the misfortunes of being a prey to the typhus virus. If lice can dread, the nightmare of their lives is the fear of some day inhabiting an infected rat or human being. For the host may survive; but the ill-starred louse that sticks his haustellum through an infected skin, and imbibes the loathesome virus with his nourishment, is doomed beyond succor."

We are informed that the modern louse is of two varieties, one sucking and the other biting, and that they are both parasitic developments probably from an ancient order of pre-cockroaches, from which our present cockroaches and termites have also been derived, a relationship not unlike that of man and the higher apes. We are told that "by adapting itself to parasitism, the louse has attained the ideal of bourgeois civilization, though its methods are more direct than those of business or banking, and its source of nourishment is not its own species."

Although lice are found on most animals an interchange of host is not usually possible, each animal having its own peculiar kind. It has been suggested that the spider monkeys were first infected with lice from man when he appeared in tropical America after the Old World dispersion. "The *pediculus humanus nigritarum,* or head louse of the African Negro, is slightly different from the head louse found on European and modern American heads." But in this country there seems to be "no correlation between louse types and racial types of the human hosts. It appears that America, the melt-

ing pot of human races, has also become the melting pot of lice." The body louse developed from the head louse, but only when the host began to wear clothes. It appears that primitive races do not harbor body lice.

The antiquity of the louse's association with man is attested both by the presence of nits upon the hair of ancient mummies and by the presence of the embalmed bodies of the lice themselves. This association was long taken quite naturally. Until very recently respectability and breeding imposed no barriers to the age-long companionship. But now that cleanliness has become fashionable among the upper classes, and among the middle class "the bathtub is no longer used for storing coal," the louse has about gone. However poverty and distress are not altogether vanished, and until they are, the louse will remain, and as long as we have the louse, so long will we have to fear typhus fever.

Hanging Separately.

The medical profession of Virginia needs to become more vocal, and something must be done to put power behind its spoken opinion. Among other things the Medical Society of Virginia needs some properly constituted committee which will be on its toes to see that the medical profession is duly consulted and its wishes regarded in all appointments pertaining to the health of the people of Virginia.

Several local medical societies as well as a number of individual physicians recently protested the appointment of a layman to head the new government Facility near Roanoke. In spite of these remonstrances General Hines and his organization appear to be moving right ahead with their plans. The scattered protests of the medical profession have been about as effective as the beating of African tomtoms in the interest of rain.

The recent appointment of two laymen to vacancies on the General Hospital Board of the State sets one to speculating whether or not this may not also have been accomplished over the protests of the officials of the Medical Society of Virginia.

A vacancy now exists in the State Department of Public Welfare. No one has yet been named to the Bureau of Mental Hygiene. One wonders with whom the powers on Capitol Hill will confer before naming Dr. Drewry's successor.

Time was when the physician could afford to be a chronic individualist. He enjoyed oracular powers and revelled in being looked up to. He was consulted by his neighbors on all subjects, professional and otherwise, and his advice was heeded. He liked being the paragon Robert Louis Stevenson described him. In a less complex society there was no need for mass action.

Times have changed. The public now accepts nothing as authoritative. A newspaper squib on health has more weight than the family physician. Anatomical and physiological knowledge gained in high school is unabashed before the superior training of the physician. The claims of specialization have played a part in this independence of popular attitude. The average patient now decides what his own ailment is and seeks directly the specialist who is believed to possess superior skill in this particular field, with the same self-assurance and eclat with which he would call the plumber for a broken pipe or a carpenter for a hole in the fence.

The physician is to blame for this attitude. He has not been quick to realize that the individualist has no chance in a highly organized society. Some of his dearest perquisites will be lost unless he learn to work with his fellows against thoughtless encroachments of others. His medical society must be something more than his professional inspiration. It must become his spokesman in all matters concerning the conditions of his practice. He must learn again the secret of the guild. Those powerful groups of the Middle Ages organized for mutual aid and protection were tremendously effective in securing the objects sought.

In union there is strength. Alexander and his Greeks knew this when their united phalanxes again and again swept before them the superior hordes of equally brave Persians, and setting out from Macedonia did not rest until they had planted the banners of the conqueror of the world in the courtyard of the Pharaohs. The old Roman knew this when he demonstrated to his quarrelling sons that whereas a single faggot could be easily broken, a bundle of faggots would resist the strength of the best of them. A signer of the Declaration of Independence knew this when to his wavering fellow patriots he said: "If we do not hang together we will hang separately."

Theobald Smith.

The distinguished old man died the other day at Princeton, N. J., in his seventy-sixth year. Dur-

ing his long career he occupied many positions of importance, the last being Director of the Department of Animal Pathology of the Rockefeller Institute of Medical Research. Many honors and distinctions came to him. He will long be remembered as a pioneer in the study of the nature and causation of infectious and parasitic diseases and in immunological research. In 1886 he showed that immunity from hog cholera can be conferred upon an animal who has received an injection of the filtered products of the specific organism. In 1889 he described the *pyrosoma bigeminum*—the cause of Texas fever—and demonstrated its transmission by the cattle tick. In 1893 he discovered "the Theobald Smith phenomenon"—an anaphylactic reaction produced by the bacterial products of diphtheria. In 1898 he differentiated the human from the bovine type of tubercle bacillus. Few American pathologists have left so large a scientific legacy.

Early Returns.

Only 325 of the 1,800 ballots on birth control mailed to members of the Society on January 1st have been heard from at the time this issue goes to press. These first returns indicate a decided trend in favor of contraceptive practice. The next issue of the MONTHLY will carry a full tabulation of the ballot. By that time we hope the vote will have been swelled many fold and it is possible that there may be a significant shift from the sentiment already expressed. The vote as tabulated on January 18th showed 72 per cent of the profession favoring birth control, 12 per cent favoring it with reservations—a total of 84 per cent. The ballots thus far received have been about equally divided between the cities and the rural districts. Eighty per cent of the rural doctors advocate contraceptive measures. Ninety-five per cent of urban physicians are in favor of them.

President's Message

To the Entire Membership of the Medical Society of Virginia:

Through reading of the journals, both professional and lay, you are acquainted with the widespread agitation over and the demand for some sort of "Sickness Insurance." This issue seems to have become acute recently, especially since the appointment of the President's Committee on Economic Security. You have doubtless seen in the public press that, in the Ten-Point Program of Social Relief tentatively proposed by this Committee, one item is "Provision for meeting the economic risks of illness!"

We do not know what the recommendation of this Committee will be on questions most vitally concerning the medical profession. We do know that there is persistent propaganda by the proponents of sickness insurance in favor of legislation by this session of Congress. We hold that the medical profession should make up its mind on these questions; should formulate its point of view, and then press it as vigorously as possible through all proper and available channels.

The Medical Society of Virginia, through adoption by the House of Delegates of a report of its Committee on Medical Economics in the fall of 1932, expressed itself definitely as opposed to any form of Sickness Insurance. Has our opinion changed in the meanwhile? Should we modify our stand, or should we simply re-state our position in the langauge of the report of 1932?

Feeling the serious importance of this matter, and the necessity of promptly taking action in conformity with the prevailing professional opinion in Virginia, I am *calling a meeting of the Council of the Medical Society of Virginia at 2:00 P. M., February 11, 1935, at the Society's office, 1200 East Clay Street, in Richmond.* The Standing Committee on Medical Economics will meet with the Council.

While the Council is the official body to act for the Medical Society between sessions of the Society, this matter is of such general and profound importance to the entire membership, that I am hereby *inviting each and every member of the State Society to attend this meeting in person and express his views.* Or, from those who find it impossible to attend in person, *I invite letters* setting forth as

concisely and as definitely as possible your views (1) concerning any form of governmental control of medicine, other than that already in force; (2) any suggestion that is practicable to correct faulty or inadequate medical service to *all the people*, should such exist; (3) what definite action, if any, the Medical Society of Virginia should take in the premises. These letters should be addressed to me as President, at Abingdon, Va.

"Speak now, or forever after hold your peace!" No one should reserve the privilege of complaining over the conclusions or action the Council may arrive at, if you fail to take advantage of this sincerely offered invitation to express your views at, or in advance of, this meeting.

Yours faithfully,

F. H. SMITH, M. D., *President,*
Medical Society of Virginia.

Department of Clinical and Medical Education of the Medical Society of Virginia

Lecture Notes of Dr. Lapham Still Available.

Although there have been a number of requests for the mimeographed lecture notes on Prenatal and Postnatal Instruction by Dr. M. E. Lapham, the supply is not yet exhausted. So long as the supply lasts, sets of these notes may be obtained free, if the requests are sent to the Executive Secretary of the Department, Box 1487, University, Va.

Lecture-Clinic on Pediatrics Planned at South Boston

At a regular meeting held in South Boston on the evening of January 17th, the Halifax County Medical Society adopted unanimously a recommendation that the Society sponsor during the spring, in cooperation with the Department of Clinical and Medical Education, a lecture-clinic in the subject of pediatrics. The general plan of procedure recommended was that followed by the Department in carrying forward the postgraduate work in the subject of Pediatrics at Leesburg last summer, under Dr. George M. Lyon. However, since the lecture-clinic was proposed for the late winter or early spring months, a period of unusual activity for the general practitioner, the Society recommended that if possible arrangements be completed to hold the lecture-clinics, of which there will be ten in all, only two days each week for five weeks, rather than one each day for two weeks. Under this arrangement, the members of the Halifax County Society felt that the physicians could so arrange their work as to attend all of the meetings without interrupting seriously their regular practice. The Executive Secretary, acting for the committee of the Department of Clinical and Medical Education, was requested to go forward with the plans for the clinic. The Halifax County Society will sponsor the program locally.

Dr. I. K. Briggs is president of the Halifax County Medical Society and Dr. William C. Brann is secretary.

GEORGE B. ZEHMER,
Executive Secretary.

Proceedings of Societies

The Northampton County Medical Society

Held its regular quarterly meeting Friday, January 4, 1935. At this time, Dr. G. W. Holland, of Eastville, Va., councilor from the First District, and representative of the County Society to the State Meeting, gave a report of the Alexandria session.

Officers for 1935 were elected as follows: Presi-

dent, Dr. J. R. Hamilton, Nassawadox; vice-president, Dr. J. M. Lynch, Cape Charles, and secretary-treasurer, Dr. W. Carey Henderson, Nassawadox.

James City-New Kent Medical Society.

At the December meeting of this Society the following officers were elected and installed for the coming year: President, Dr. B. I. Bell, Williamsburg; vice-president, Dr. E. B. Kilby, Toano; and secretary-treasurer, Dr. L. V. Henderson, Williamsburg.

The October meeting was set aside as Ladies' Night, and is to be an annual affair hereafter. The wives of the members were present at that meeting, dinner was served, and a good time was enjoyed by all.

The Patrick-Henry Medical Society

Held its regular quarterly meeting in Martinsville, Va., on January 3rd, at 7 P. M. The guest speaker of the evening was Dr. J. W. Preston, of Roanoke, Va., whose subject was "Some Observations Upon the More Common Type of Pneumonia."

The officers of the Society for this year are: President, Dr. F. B. Teague, Martinsville; vice-president, Dr. B. A. Hopkins, Stuart, and Secretary, Dr. C. R. Titus, Bassett.

The Floyd County Medical Society,

At its last meeting held recently, elected the following officers: President, Dr. S. T. Yeatts, Floyd, and secretary, Dr. F. Clyde Bedsaul, also of Floyd.

The Roanoke Academy of Medicine

Held its regular meeting at the Elks Club, January 7th at 8:30 P. M., under the presidency of Dr. W. P. Jackson, of Roanoke. At this time Dr. A. T. Cole, of Catawba Sanatorium, was elected to membership in the Academy.

The following Scientific program was presented:

Intestinal Obstruction—Case Reports—Dr. P. A. Richards.

Discussed by Drs. Preston and Stephenson.

Syphilis, with Relation to Eye, Ear, Nose and Throat Complaints—Dr. John A. Pilcher.

Asthma—Dr. K. D. Graves.

Recent Progress in Combating Tuberculosis—Dr. Fred Oast.

Discussed by Drs. Hagan, Nicholls, and Gill.

FRANK HELVESTINE, JR.,
Secretary-Treasurer.

The Lynchburg Academy of Medicine

Met Monday, January 7th. At that time Dr. I. A. Bigger, Professor of Surgery of the Medical College of Virginia, presented an interesting and stimulating paper on "Primary Malignancies of the Lung" illustrated with lantern slides.

Dr. R. D. Caldwell is president of the Academy and Dr. John Hundley, Jr., secretary. Both are of Lynchburg, Va.

News Notes

The Tri-State Medical Association of the Carolinas and Virginia,

Under the presidency of Dr. Paul V. Anderson, Richmond, Va., will hold its annual meeting in Charlotte, N. C., February 18th-20th. An excellent program has been prepared and will be mailed members in a few days. Included in this are some of the best known men in the country who will present papers or conduct clinics.

Dr. J. M. Northington, Charlotte, N. C., is secretary of this Association.

To Head Health Work in Albemarle County and Charlottesville.

Dr. Charles Howe Eller has been named by the Joint Board of Health as public health officer for Albemarle County and the city of Charlottesville, the position formerly held by Dr. E. L. McQuade, now with the State Health Department. Dr. Eller comes from Albuquerque, N. Mex., where he is health officer for the county of Bernalillo. He is thirty years of age and a graduate of the University of Colorado School of Medicine, and received the degree of Doctor of Public Health from the Johns Hopkins School of Hygiene and Public Health, Baltimore. Before serving as health officer in Albuquerque he engaged in private practice. He will enter upon his new duties on April 1st.

News from Medical College of Virginia.

Dr. Hunter McGuire, of Winchester, Va., has been appointed to the Board of Visitors of the col-

lege to fill the vacancy made by the death of Colonel John W. Williams.

The college was represented by a goodly number of its faculty at the dinner for Dr. S. C. Mitchell on January 23rd. This dinner was sponsored by the University of Richmond where Dr. Mitchell is professor of history and political science. Early in February Dr. Mitchell will leave for an extended trip abroad and the dinner is in the nature of a birthday celebration and bon voyage party in recognition of his outstanding service to education and to civic welfare. Dr. Mitchell has been president of three institutions, the University of South Carolina, University of Delaware, and the Medical College of Virginia.

The portrait of Dr. Socrates Maupin, one of the founders of the college, is now being painted by Mr. John Slavin, of Richmond.

Dr. James Gudger '30, and Dr. Emory Anderson '33, have gone to Paris where they will serve a year's interneship at the American Hospital there.

The regular scientific monthly meeting of the staff was held January 10th. The program was as follows:

Simple Cyst of the Liver with Report of a Case, by Dr. Harry Warthen and Dr. V. H. Griffin.

Treatment of Megacolon with Calcium Parathormone with Report of Three Cases, by Dr. Louise Galvin.

Roentgentherapy, Some of its Present-Day Problems, by Dr. Frederick B. Mandeville.

Dr. A. M. Ambrose of the physiology and pharmacology department has recently collaborated with Dr. C. P. Sherwin, of New York, in writing a chapter on detoxification for a new textbook on biochemistry to be released on February 1st.

News from New York Polyclinic Medical School and Hospital.

Dr. Pol N. Coryllos gave an afternoon lecture on January 12, 1935, on "Surgical Treatment of Pulmonary Tuberculosis."

Dr. Russell L. Cecil will give an afternoon lecture on Wednesday, February 6, 1935, at 2:30 P. M., on "Foreign Protein Therapy."

Members of the medical profession are invited to attend all programs and lectures presented at the Polyclinic Hospital.

The Duke University School of Medicine

Began its winter quarters on January 3, 1935, with a total of 183 students. The School of Nursing, starting the quarter at the same time, had a total of fifty-nine. Six seniors in the School of Medicine completed their course December 18, 1934, and are now interning in various hospitals.

The Gill Memorial Eye, Ear and Throat Hospital

Will hold its Ninth Annual Spring Graduate Course in Ophthalmology, Otology, Rhinology, Laryngology, Facio-Maxillary Surgery, Bronchoscopy and Esophagoscopy, in Roanoke, Va., April 15th-20th. The guest members of the faculty are Drs. Oscar V. Batson, Philadelphia; William V. Mullin, Cleveland; Lyman Richards, Boston; John A. Kolmer, Philadelphia; Harry S. Gradle, Chicago; Ben Witt Key, New York; Ralph I. Lloyd, Brooklyn; A. B. Reese, New York; and Dunbar Roy, Atlanta. The resident members are Drs. Elbyrne G. Gill, John A. Pilcher, Jr., J. Lawson Cabaniss and Mr. Nathan Ridgeway, all of Roanoke. All lectures, demonstrations and operations will be given at the hospital, and the round table discussions will be at the Patrick Henry Hotel each day immediately following lunch.

Further information may be received from the Superintendent of the Hospital, Box 2467, Roanoke, Va.

Dr. J. L. DeCormis,

Accomac, Va., has been elected president of the Eastern Shore of Virginia Production Credit Association, for the present year.

Dr. Cary T. Grayson,

Of the U. S. Navy retired, and physician to the late President Wilson, has been appointed by Governor Peery as a member of the Board of Visitors of the College of William and Mary. Dr. Grayson is a native of Culpeper, Va., and an alumnus of that College.

Southeastern Surgical Congress.

The sixth annual assembly of the Congress will be held in Jacksonville, Fla., March 11, 12 and 13, 1935. It has met previously in Atlanta, Bir-

mingham and Nashville. The states composing the Congress are Alabama, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee and Virginia. A record attendance is anticipated at the Jacksonville meeting. Since March is the most desirable month to visit the land of flowers many surgeons will no doubt combine business and pleasure and attend during this season of the year.

Some of the most distinguished surgeons in the country representing the different surgical specialties have been invited to appear on the program. A partial list of those who have already accepted places is as follows: Drs. Walter C. Alvarez, Perry Bromberg, Hugh Cabot, Willis C. Campbell, George W. Crile, John F. Erdmann, Paul Flothow, Ralph Green, Arthur Hertzler, C. Jeff Miller, Alton Ochsner, J. C. Patterson, J. Knox Simpson, J. W. Snyder and W. A. Weldon. More than twenty others will be listed when the program is completed. Look for the completed program which will be mailed about February 15, 1935.

For information address Dr. B. T. Beasley, Secretary-Treasurer, 1019 Doctors Building, Atlanta, Ga.

Dr. A. I. Dodson

Has been elected first vice-president of the Civitan Club of Richmond, Va., for the present year.

Chief Medical Officer at Roanoke Hospital.

Dr. Letcher E. Trent, a veterans' administration psychiatrist, has been appointed chief medical officer of the new Veterans' Administration Facility at Roanoke, Va., and will enter upon his duties there before the first of March. Dr. Trent is an alumnus of the former College of Physicians and Surgeons of Baltimore. After service in the Army medical corps during the World War, he entered the civilian Government service and has had wide experience in neuropsychiatry. In his new position, he will have charge of all of the clinical and medical activities of the Roanoke institution.

Dr. Henry L Bastien,

Formerly medical officer at C. C. C. Camp No. 96, Williamsport, Pa., has located for general practice at Clarendon, Va., with offices in Post Office Building. Dr. Bastien is an alumnus of the Georgetown University School of Medicine in the class of '32.

Famous Medical Journal Editor Dies.

Dr. Lewis Stephen Pilcher, scholar and editor for half a century of the *Annals of Surgery,* died December 24th, at eighty-nine years of age. Country school teacher, country practitioner, naval surgeon, student of tropical disease, anatomist, professor of surgery, editor, bibliophile, patrioit—these nouns indicate a few of his many interests and activities over a long and intensely useful life.

In 1884 he became editor of the *Annals of Surgery,* which position he occupied to the time of his death. This publication, beginning in 1884, was acquired in 1897, by J. B. Lippincott Company, but the editorial policy and censorship of advertising were never relinquished by Dr. Pilcher. The *Annals of Surgery* will continue to carry on under an editorial board of distinguished writers.

Petersburg Hospital Staff.

Dr. Wilbur M. Bowman was elected chairman of the Petersburg, Va., Hospital Staff, at its annual meeting early in January. He succeeds Dr. W. A. Reese. Other staff officers are: Dr. E. J. Nixon, vice-chairman; Dr. Wright Clarkson, secretary; Dr. H. M. Snead, vice-secretary. Dr. Herbert C. Jones was named a member of the medical committee; Dr. E. J. Nixon chairman and Dr. H. Cantor secretary of the surgery committee. Dr. E. W. Young, chairman, and Dr. W. B. McIlwaine, secretary of the medical committee; Dr. Meade Edmunds, chairman of the eye, ear, nose and throat committee; and Dr. Allen Barker, chairman of the X-ray department.

Dr. Wayne M. Phipps,

Hopewell, Va., has been elected one of the directors of the Kiwanis Club of that city for the present year.

Married.

Dr. J. E. Haynesworth, Buckingham, Va., and Miss Paula Irving, Farmville, Va., January 19th.

Dr. Arthur Clayton Sinton, Jr., and Mrs. Virginia Chesterman Wickham, both of Richmond, Va., January 15th.

Dr. Thomas Preston McKee, of the class of '31, University of Virginia, and Miss Rose Clifton, Clarksburg, W. Va., January 12th. Dr. McKee is a son of Dr. and Mrs. T. K. McKee, of Saltville, Va., and recently interned at the New York Postgraduate Medical School and Hospital, of New York City.

Dr. H. A. Spitler,

Middleburg, Va., has been re-elected first vice-president and a member of the board of directors of the Middleburg National Bank.

Dr. Dan O. Nichols,

Charlottesville, Va., has been elected a member of the new board of directors of the Kiwanis Club of that city.

Dr. Paul McBee

Announces the removal of his surgical practice from Bakersville, N. C., to the Marion General Hospital at Marion, N. C. He will have offices there in the Monogram Building.

Dr. Paul S. Hill,

Class of '30, University of Virginia, has opened offices in Professional Building, Harrisonburg, Va., for the practice of general surgery.

Dr. Charles W. Scott,

Former clinician to the Tuberculosis Outpatient Service of the Virginia State Health Department, recently practicing at Hampton, Va., has now moved to Newport News, Va. He is associated with Dr. L. E. Stubbs and Dr. Waverly Payne in the practice of internal medicine, with offices in Medical Arts Building. Dr. Scott recently spent several weeks at the University of Virginia Hospital studying cardiac diseases and electrocardiography under Dr. J. Edwin Wood.

Dr. Clifton M. Miller,

Richmond, Va., by invitation gave a series of talks on the eye before the International Postgraduate Medical Assembly in San Antonio, Texas, January 29th, 30th and 31st.

Dr. J. G. Bentley,

For sometime at Blackwood, Va., announces that his address is now Pardee, Va.

Negro Doctor Honored.

Dr. Morgan E. Norris, Negro physician of Kilmarnock, Va., was recently honored when a new school at that place, costing approximately $15,000, was named for him with appropriate exercises. Dr. Norris was the promoter of the project and it was through his effort that the school was erected.

Dr. Louis Klein,

After a long term of noteworthy service with Parke, Davis and Company, on January 1st assumed direction of all the Hoffman-La Roche medical activities at Nutley, N. J. Notwithstanding his heavy responsibilities in the commercial field Dr. Klein has made it an important point to remain above all a physician, for behind his reputation in the marketing of high quality pharmaceutical products are ten years of active practice of medicine. He has maintained his clinical connections right along and, until leaving Detroit to go with Hoffman-La Roche, was on the medical staff of Harper Hospital, and until recently also he was consulting endocrinologist to the Wayne County Juvenile Court in Detroit. Dr. Klein is a member of the Association for the Study of Internal Secretions, County and State Medical Societies, and a Fellow of the American Medical Association.

Dr. R. A. Martin's Memory Honored.

The city of Petersburg has presented the Petersburg Health Center with a portrait of the late Dr. Robert Alston Martin, who served as health officer of that city from 1899 to the time of his death, April 1, 1931. The portrait has been hung above the bronze plaque erected in memory of Dr. Martin in the Health Center by his co-workers, shortly after his death.

Dr. E. G. Gill,

Roanoke, Va., has accepted an invitation extended him recently to become a member of the Advisory Council of the American Brotherhood for the Blind. This is a non-sectarian, non-profit organization, devoted solely to the service of the sightless. During the past fourteen years, this Association has published a large amount of Braille literature and these publications as well as other services are free to the blind.

Dr. V. W. Quillen,

Nickelsville, Va., left the first of January to spend several months in New Orleans, La., for postgraduate review courses in medicine at Tulane University.

Civil Service Examination.

The U. S. Civil Service Commission announces an open competitive examination for Junior Medical Officer (Interne), at St. Elizabeth's Hospital, Washington, D. C. Applications for this position must be on file with the Manager of the Fourth U. S. Civil Service District, Washington, D. C., not later than February 18, 1935.

Dr. R. E. Booker,

Lottsburg, Va., has been elected vice-president and a member of the board of directors of the Bank of Northumberland, Inc., of Heathsville, Va.

Dr. E. L. W. Ferry,

Millers Tavern, Va., has been elected one of the stewards for this year of the Arlington Masonic Lodge, No. 102, A. F. and A. M., at that place.

Dr. M. M. Greenbaum,

Class of '34, Medical College of Virginia, recently at the Morrisania Hospital, New York City, is now interning at the Paterson General Hospital in Paterson, N. J.

Dr. P. R. Fox,

McComas, W. Va., an alumnus of the Medical College of Virginia, has been elected president of the Mercer County (W. Va.) Medical Society.

For Sale—

By eye, ear, nose and throat specialist, a specialist cabinet, chair, and cuspidor with attachments. For further information, address No. 469, care this journal, 1200 East Clay Street, Richmond. (*Adv.*)

For Sale—

Burdick Ultra-Violet Lamps. Slightly used. May be seen at Surgical-Laboratory Showrooms on 12th St., between Broad and Marshall Sts., Richmond, Va., or write W. O. Hester, 3122 W. Grace St., Richmond, Va.

Obituary Record

Dr. William Tilden Smith,

Widely esteemed physician of Norfolk, Va., died at his home in that city on December 28th, after an illness of nearly a year. He was a native of King and Queen County, Virginia, and fifty-six years of age. He studied medicine at the Medical College of Virginia from which he graduated in 1904. Following this, he practiced for a year in Essex County, Virginia, before locating in Norfolk where he had since made his home. Dr. Smith had been a member of the Medical Society of Virginia for thirty years; he was active in the civic, professional and church life of Norfolk, and was a Mason and Kiwanian. He is survived by his wife, an adopted daughter and a large family connection.

Dr. Frank Powell Dickinson,

Fredericksburg, Va., died of heart disease, October 31, 1934. He was seventy-six years of age and a graduate of the former University College of Medicine, Richmond, Va., in 1899. Dr. Dickinson was at one time a member of the Medical Society of Virginia.

Dr. Charles Dudley Underhill,

Middlebrook, Va., died about January 10th, after several years of failing health. He was sixty-eight years of age and a graduate of the Harvard University Medical School, Boston, in 1888. Dr. Underhill was also a church organist and had composed and published many pieces of sacred music. He was formerly a member of the Medical Society of Virginia and was in service during the Spanish-American War. His wife and a daughter survive him.

Dr. Heath Ashby Dalton,

Hillsville, Va., died December 2nd, of heart disease. He was forty-five years of age and a graduate in the class of '14, Medical College of Virginia.

Dr. Theobald Smith,

Princeton, N. J., died December 10th, aged seventy-five years. He was a graduate of the Albany (N. Y.) Medical College in 1883. Dr. Smith was a widely known pathologist and his contributions to medical science have been varied and of far-reaching importance. He was probably most widely known for his differentiation of the human tubercle bacillus from the bovine tubercle bacillus. Honorary degrees from a number of universities in this country and abroad had been awarded Dr. Smith and he was also the recipient of many medals for his scientific achievements. At the time of his death, Dr. Smith was director emeritus of the Department of Plant and Animal Pathology of the Rockfeller Institute for Medical Research.

Resolutions on Death of Dr. J. W. Henson.

The Staff of the Retreat for the Sick Hospital of Richmond, adopted the following resolution on Dr. Henson:

Dr. J. W. Henson was born October 3, 1863, at Scottsville. He was a representative of families established in Virginia more than two centuries ago. He was the son of Mrs. Marie Antoinette Hoge Henson and the late William Henry Henson, who served with distinction in the Confederate army with the Fourteenth Virginia cavalry.

Dr. Henson spent his early life at the old family home in Louisa County and was a pupil in turn at the Green Springs Academy, in Louisa and the Hoover Select Military Academy at Staunton, Virginia. He later continued his studies at Richmond College and then taught school for a brief period. He entered the Medical College of Virginia in the fall of 1886 and was graduated from that institution with the M. D. degree in the spring of 1889.

Dr. Henson was a brilliant and forceful teacher and taught continuously at the University College of Medicine and Medical College of Virginia from 1890 to about 1923. During that period he served as Adjunct Professor of Anatomy, Demonstrator of Anatomy, Professor of Anatomy, Professor Surgical Anatomy, Lecturer on Principles of Surgery, Professor of Principles of Surgery, Professor of Genitourinary Surgery, Demonstrator in Orthopedics and Associate Professor of Surgery.

He was also devoted to many charitable institutions and in this connection will probably be best remembered for his work in the Woman's Relief Association. He was active in its organization in 1922 and was chairman of the staff from its inception until the time of his death. He was also actively associated with the Retreat for Sick Hospital and under his guidance the staff was reorganized several years ago and brought up to a standard which was acceptable to the American College of Surgeons, which standard it has maintained until the present time. He was for many years Chief of the Surgical Staff and Chairman of the Executive Committee and was active in this work up until a few months ago, when he resigned on account of ill health.

Dr. Henson was a kind and sympathetic physician. He possessed a keen sense of clinical judgment which he diligently and fruitfully applied to his practice. Through his earnest and conscientious efforts in behalf of those to whom he ministered, he was invariably able to gain their confidences and friendships, both of which he held in many instances throughout his entire professional life.

Therefore, be it resolved, That in the death of Dr. J. W. Henson, which occurred at the Retreat for the Sick, on November 28, 1934, the Retreat for the Sick Hospital has sustained a great loss, likewise the city and community in which he labored with such boundless charity, and

Be it further resolved, That these resolutions be spread upon the minutes of the Staff of the Retreat for the Sick, that a copy be sent to the bereaved family and that they be published in the VIRGINIA MEDICAL MONTHLY.

THOS. D. JONES,
W. L. BALL,
Committee.

Resolutions on the Death of Dr. John Dunn.

The Richmond Society of Ophthalmology and Otolaryngology has expressed the following appreciation of Dr. Dunn:

Dr. John Dunn was born in Petersburg, Virginia, November 4, 1862, and as a boy received his preparatory education at McCabe University, and how well he absorbed the teachings of its peerless headmaster can be attested by his life. He later entered the University of Virginia, where he won his M. A. and M. D. degrees.

His post graduate work was only ended by his recent illness, for he was always the student, contributing articles of note to the leading medical publications, especially the Archives of Ophthalmology. His storehouse of knowledge was always open to his confreres for the asking, and time has proven the inestimable value of his advice to the younger members of his profession. There have been none who has given more liberally of his talents to rich and poor alike, than Dr. John Dunn, and we would accord to him the title, "Richmond's First Citizen."

Although an indefatigable worker, he found time to indulge his faculty of keen appreciation of nature's great works, and his soul expanded in the contemplation of the giant oak or the modest flower.

He was meticulously honest in his opinions, in fact, in every phase of his life and never adopted the frills and fads of medical practice, as he, in his busy day, had time only for the essentials. Frills and fads were incompatible with his ideals. We like to think of him as the cultured gentleman practicing a noble profession as it should be practiced, as a true disciple of Hippocrates.

Therefore be it resolved, By the Richmond Society of Ophthalmology and Otolaryngology that in the passing of Dr. John Dunn, we have lost a valued counselor whose experience, knowledge and judgment will be sadly missed; that we wish to express to the family of Dr. Dunn our deep sympathy in their bereavement.

And, be it further resolved, That a copy of these resolutions be sent to the family of Dr. Dunn, a copy spread upon the minutes of the Society and published in the VIRGINIA MEDICAL MONTHLY.

W. WALLACE GILL,
KARL S. BLACKWELL,
R. HERBERT WRIGHT,
Committee.